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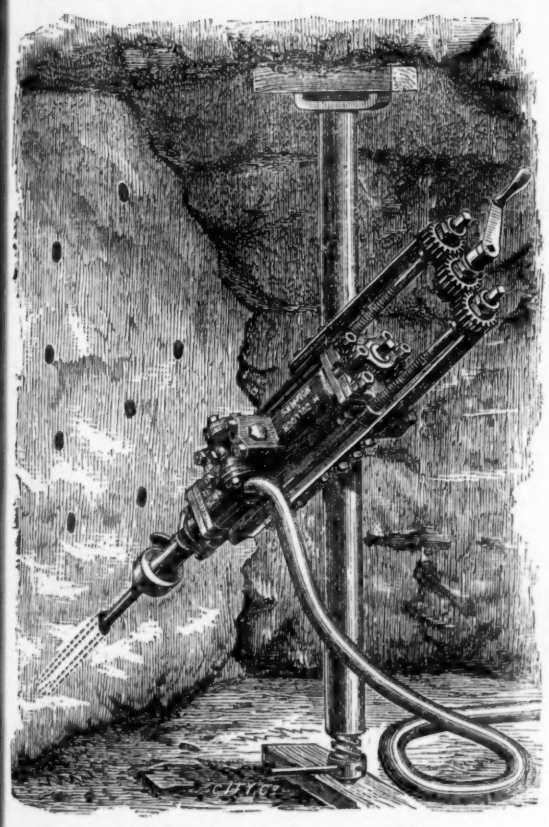

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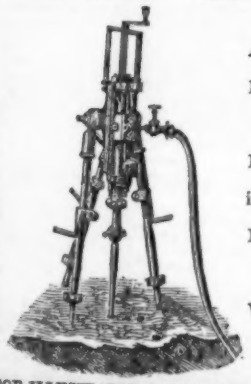

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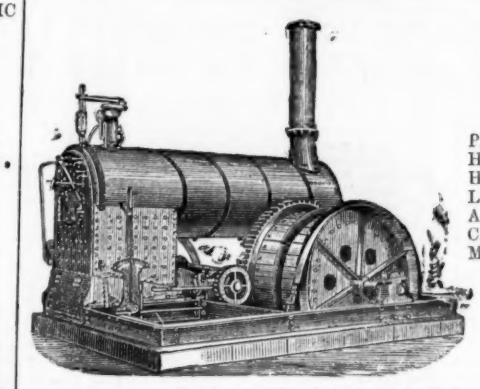

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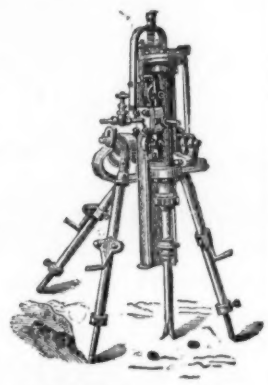

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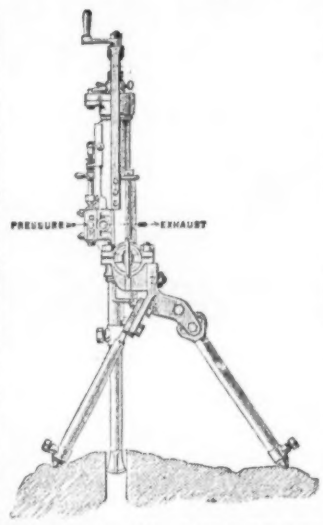

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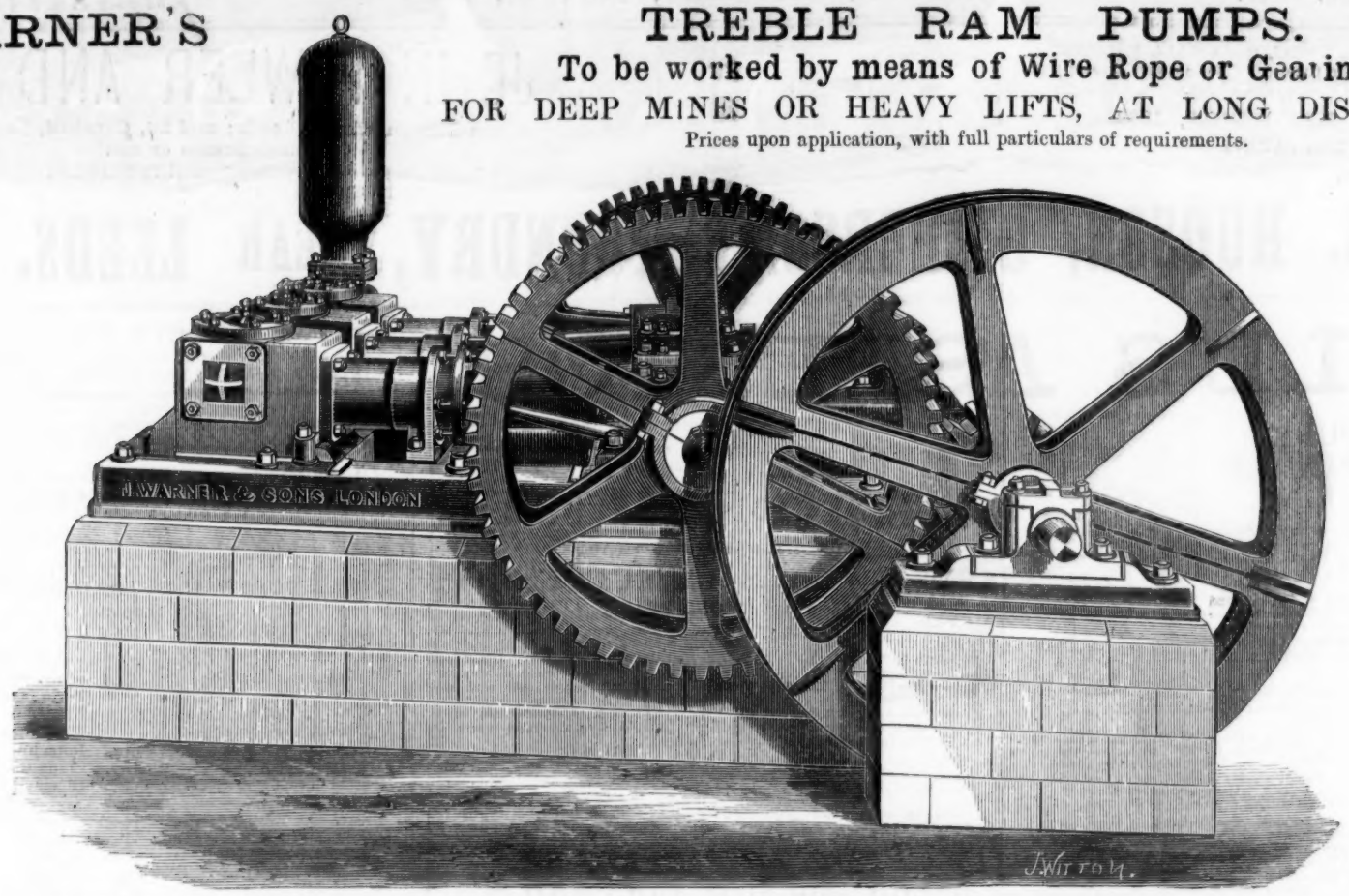

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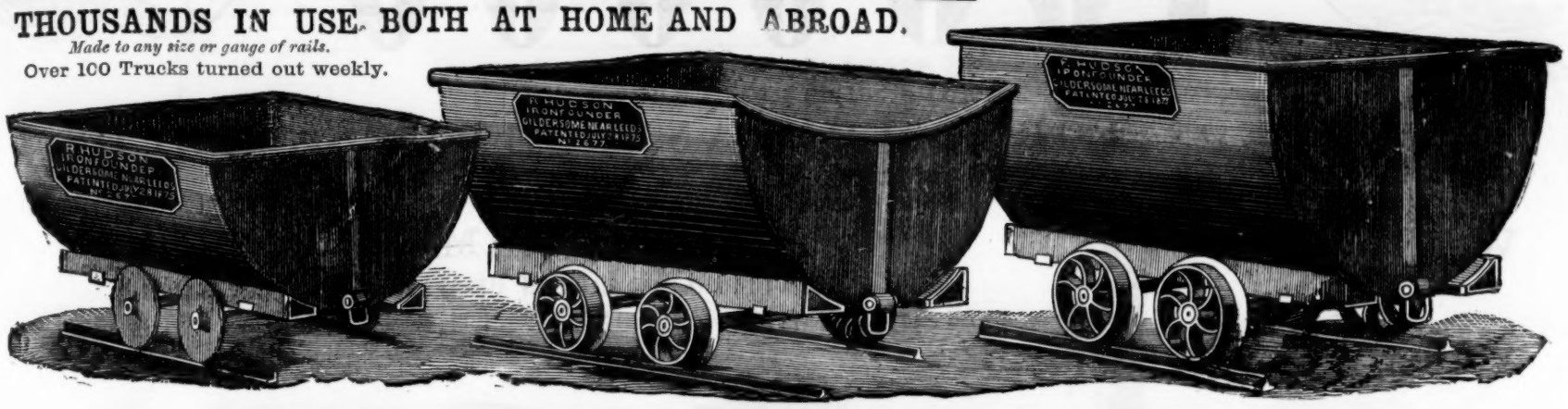

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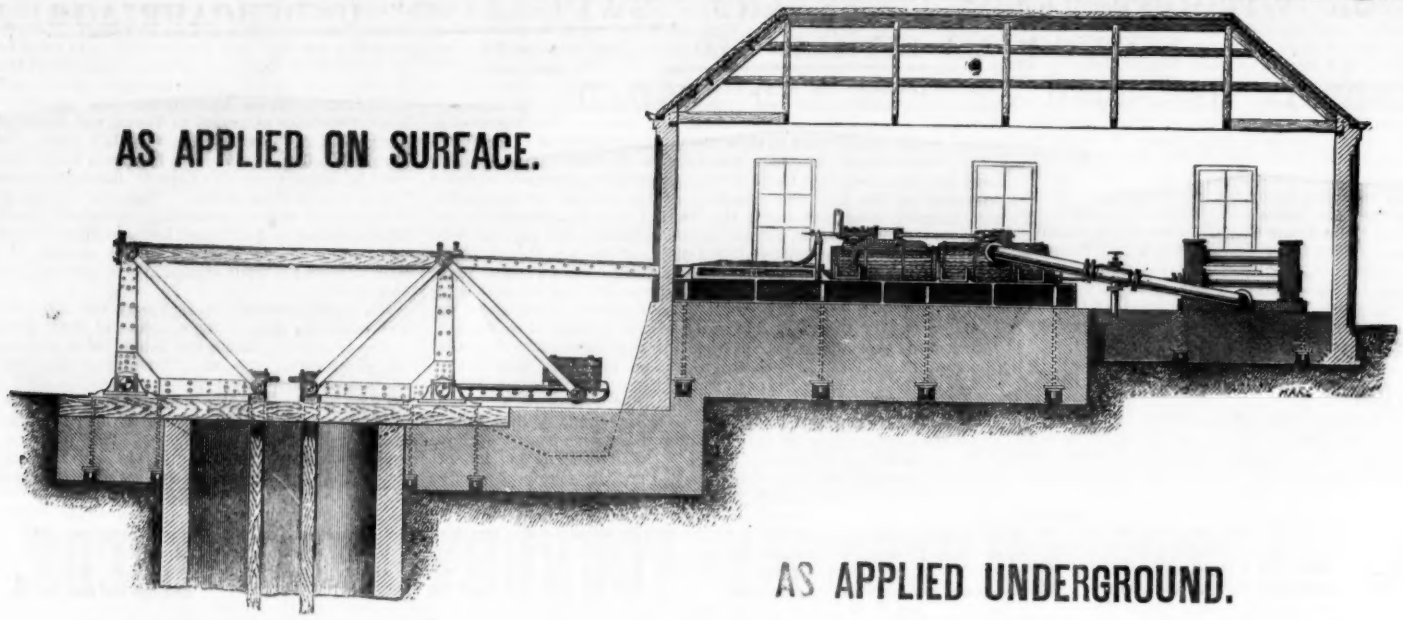

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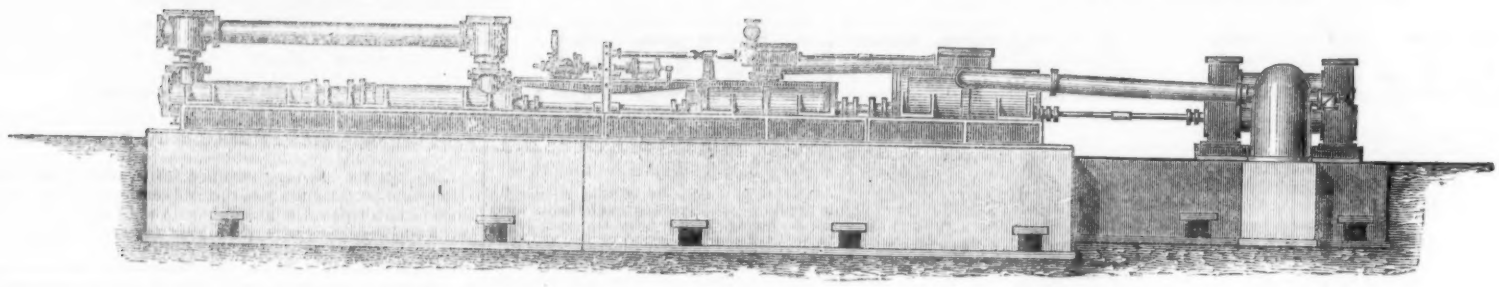

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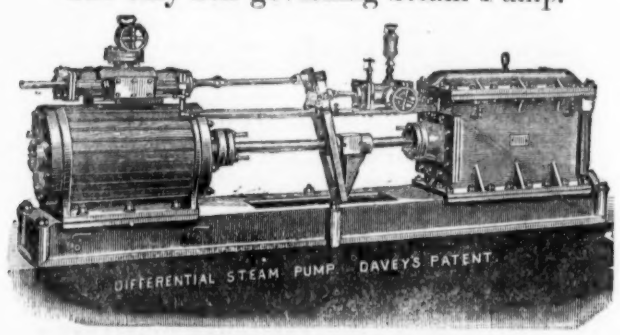

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10	9	15	17,300	70	85	100	120	4 1/2	1 1/2	2 1/2
12	6	24	6,500	250	90	104	130	5 1/2	2	2 1/2
12	7	24	10,500	180	96	110	136	6	2	2 1/2
12	8	24	13,500	140	100	114	142	7	2	2 1/2
12	10	24	21,300	90	120	136	175	5 1/2	2	2 1/2
14	7	24	10,400	250	110	130	156	5 3/4	2 1/2	3
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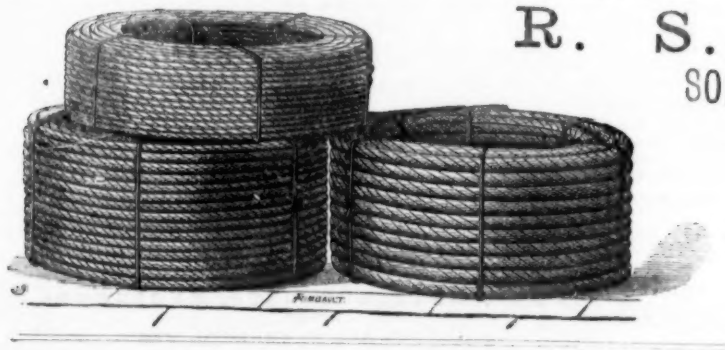

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Original Correspondence.

INDIAN GOLD MINING, AND ITS PROSPECTS—No. III.

QUARTZ OUTCROPS OF TRAVANCORE.

By J. MACDONALD CAMERON, Fel. Inst. Chem., F.C.S., &c.
(Late Assistant Chemical Laboratories, Royal School of Mines).

In order to trace more completely the comparison between the lithology of the auriferous zone of the Wynaad and those districts of Travancore which I visited, I shall once more direct attention to what I have quoted from the Commissioners' report of 1832 (Art. II., M. J., p. 518)—"that the superstructure consists of sand and gravel, below which are large nodules of quartz and gneiss." Now, in many parts of Travancore, where the soft gneissic rock occurs, there are beds of quartz sometimes 2 ft., 3 ft., or even 6 ft. in thickness, having interspersed throughout their mass here and there crystals of felspar, in a state of decomposition. Further, these beds having been for a considerable period of time exposed to atmospheric influences, as well as to ærated aqueous solutions, have had the more easily decomposable portions of their walls—which consisted principally of felspathic and ferruginous compounds—washed away by the periodical monsoon rains, leaving crevices which have afterwards become filled up by the earthy materials resulting from the decomposition of the gneissic rock in which they are embedded. Such beds occur on Ballamore, Kildonan, and Ballochbuie estates. One of the Ballochbuie beds I caused to be opened to a depth of from 4 to 5 feet, and had some of what appeared to be the purest and most compact part of the quartz bed blasted. This revealed a beautiful thin vein of mundic from 1 to 2 in. in width, and alongside of its quartz matrix a vein of iron ore about 1 ft. in thickness, largely impregnated with crystals of the arsenical mineral. Some of what appeared to be the purest specimens of it, as well as the quartz matrix in which it was found embedded, were assayed in my laboratory, and showed appreciable quantities of gold.

What may be the lithological composition of the highest of the Travancore Ghauts I cannot precisely say, as my instructions kept me quite within the spurs, but the most elevated of those rock masses which I examined are most certainly a very quartzose form of gneiss, and as this rock and its homologues—quartz rock, mica-schist, and clay-slate—most usually accompany the older igneous rocks, I have come to the conclusion that the highest and more barren peaks of Travancore, like those of the Wynaad and Neilgiri ranges, are probably granitic. Gneiss rock then in its several varieties may be said to be the rock *par excellence* of Travancore. In the southern portion of Assamboo district, in the neighbourhood of Retreat, Little Valley, Glenmore, Glenbeg, Corriemony, Seafield, Ballamore, and Hillside estates, and along what is locally known as the Great Valley, we have the more compact and quartzitic variety largely studded with the common garnet, and less of the quartzose form; but from the Great Valley northwards along the district road to Agustier, Glenelg, Bon Accord, and Oaklands estates, and further through Merchiston, Ballochbuie, Strathmore, and Glenisla onwards to Invernettie estate in the Kulratti district, those two leading varieties of gneiss rock alternately predominate. Occasionally, however, there are found the other rocks of the metamorphic series—mica-schist and clay-slate. On the opposite side of the great gorge, travelling from Oaklands bungalow to that of the estate Conductor at Kildonan, there is a most remarkable instance of sudden transition from the quartzose form of gneiss to the fine grained and light yellowish fissile and quartzitic variety which so much resembles hard compact sandstone. As the ravine is entered there is a bold escarpment of the quartzose variety several hundred feet in height, with an almost horizontal dip, which rapidly increases until as the quartzose characteristics are lost, and the bungalow is approached, the beds become almost vertical.

The mica-schist group I did not find largely represented, but it crops out in some of its varieties, such as chlorite and hornblendic schists to a greater or lesser degree at Auldbar, and at certain points along the district road between the latter place and Invernettie estate. On the left front of the superintendent's bungalow at Auldbar there are interesting outcrops of this group. As might be expected in a country where the metamorphic system of rocks is so well represented as in Travancore, the minerals which usually accompany it would also be present in a corresponding degree. Thus talc, hornblende, chlorite, and actynolite, and several varieties of felspar may be met with in almost any portion of the country from Invernettie in the north to Mahendrigherry in the southern portion of Assamboo district; but what struck me most was the size, beauty, and variety of colour of the felspars; some of them passing from the dull yellow of the orthoclasic variety to the pale green of talc. Indeed were it not for the softness of the latter mineral some of the Travancore felspars might readily be mistaken for it, especially in cases where the outlines of the felspathic crystals are not very clearly defined. Magnetic oxide of iron is not only present in abundance in the metamorphic rocks of Travancore, but it may be seen to even a greater extent in the coffee soils on the mountain slopes, as well as in the soils of the low country and along the road sides after a shower of rain. In walking along the sea-shore at Colachel, and watching the waves of the Indian Ocean break upon their sandy beach, I was much struck with the very great quantity of this mineral, which in wreath-like masses became exposed to view as the waters of each spent wave receded to their briney source. Graphite or plumbago, which is one of the most valuable minerals belonging to the metamorphic system I have also met with. In the low country in the neighbourhood of Trevandrum, the capital, I am informed that there are very satisfactory and extensive beds of this substance, and samples alleged to have been taken from some of these beds I have had submitted to analysis in my laboratory, and found them to be of first-rate quality, as indeed their appearance indicated.

Having now briefly noticed the geological and mineralogical characteristics of the Wynaad and Neilgiri districts, and so far compared them with those of Travancore, I shall proceed to notice the quartz outcrops of the latter country so far as my survey of it enables me. What I have quoted from the several reports already mentioned shows that the greater portion of the rocks of the Wynaad, Neilgiri, and Travancore districts of India belong to the metamorphic system, and when it is considered that this system embraces the gneiss, quartz-rock, mica-schist, and clay-slate groups, and that I have shown in the preceding articles that the former group greatly abounds, and the two latter to perhaps only a small extent in Travancore, it might reasonably be expected as a consequence that somewhere in that country the quartz rock group, as well as quartz veins, would be found. As previously noticed such actually is the case.

Retreat Estate.—First then in Assamboo district, at the northern extremity of Retreat estate, which belongs to Mr. G. Thornhill, and above that point where the main river which forms its western boundary is joined by one of its principal tributaries, there have been laid bare by the rapid river currents which obtain during the south-west monsoon period, several masses of syenitic rock along with beds of a reddish brown ironstone of apparently poor quality. Nearly at right angles to the direction of the river course there intersects the upper masses of syenitic rock, a band of quartz about 7 ft. wide, and which at its sides is impregnated with large crystals of felspar; these crystals increase in quantity as the quartz mass loses itself in the syenitic matrix. Its strike is N.W. and S.E., and it narrows to a width of about 2 ft. as it loses itself in the jungle, which is on the western side of the river. It has been traced for a distance of about 10 yards, and its dip, as far as I could ascertain, is nearly vertical, the felspathic constituents which, as already noticed, are largely present in that portion which is exposed in the river bed become fewer or disappear entirely at the point where it enters the jungle. Were it not for this fact it might be mistaken for a vein of graphic granite. About 15 yards below this point, or near the junction of the tributary with the main stream, there is another outcrop of quartz from 1 ft. to 2 ft. in width running through what appears to be the same syenitic rock, striking in N.W. direction, and having like the one already noticed an almost vertical dip. A few yards below the junction of the two streams there intrudes another vein of pure quartz about 1 ft. to 2 ft. in width, striking N.W. and S.E., and throwing out a branch or leader of nearly similar dimensions, which takes an east and west direction, and has also a nearly vertical dip; and a little above this again another vein is exposed for a distance of about 12 ft. running east and west, and having a bluish-pink colour. The first and second of these quartz outcrops were blasted to a depth of 12 in., and selected samples roasted and treated with mercury at Colachel, when small quantities of gold were found in them. Several of the remaining pieces of quartz, by no means the best, were taken home by me and submitted to assay in my laboratory, when they were found to yield quantities of gold varying from 1 dwt. and 1 dwt. 8 grs. to 2 dwts. per ton. Besides this I ought to mention that I came across a chip from one of these quartz outcrops that showed very minute specs of free gold.

With the exception of the first mentioned of the several outcrops of quartz on this estate all the others appear to be true reefs or veins, and although their width is not so great as the majority of those now being worked in the Wynaad, it has yet to be proved that they would not be found to increase in size were they traced further downwards or in the direction of their dip. It has besides occurred to me that possibly—nay, even probably—they would be found to be leaders to a much larger vein in their vicinity, though the time and the means at my command prevented my making excavations of a nature which would tend to show the truth or fallacy of this opinion. I may mention that the rocks associated with these quartz outcrops have not that distinctly fissile or even stratified appearance which is possessed by the different members of the several groups of the metamorphic series, nor where the lines of stratification can be defined do the quartz veins, except in one instance, run parallel with them. Further, the quantity of gold obtained per ton, though small, is no evidence that were the examination pursued to a greater depth more satisfactory results would not be obtained, and when it is remembered that these quartz outcrops have been exposed to the denuding action of the river during an untold number of monsoons, and that the atmosphere has been performing its work of degradation for an equally long period of time, we need not wonder that at a depth of 1 ft. from the surface the samples of quartz obtained failed to yield a greater quantity of gold than 2 dwts. per ton.

Ballamore Estate.—Leaving Retreat estate and passing northwards the next outcrop of quartz which I met with is on the estate of Mr. P. Grant, at Ballamore, where it showed itself in the soft quartzose gneiss at the side of the road which passes through a coffee field to the north-east of the bungalow. From the great depth of soil which covers the underlying rock its strike is difficult to determine. It appears, however, to run in a N.W. and S.E. direction, and dips to the S.W. at a considerable angle. It is distinctly bedded, and its leading characteristics have been already alluded to in this article when noticing the quartz beds of Kildonan and Ballochbuie estates. Mr. D. C. C. Grant, the present superintendent of the estate, had it excavated to the depth of a few feet, and took a quantity of quartz from it, but the crystalline structure, as well as the general character of the contents of this bed, were not promising.

Auldbar Estate.—In treating of the lithological characteristics of the Travancore I noticed that on Auldbar estate the gneissic group was well represented with here and there outcrops of mica-schist. This would suggest that the quartz-rock group which usually comes in between these two would also be present somewhere in this neighbourhood. So far as my examination went I found only one small outcrop, nor is there any vein quartz in those portions of the estate which I was enabled to examine. The outcrop of quartz to which I allude is exposed in a ravine which passes through the 23-acre field to the left of the bungalow, and which I have designated No. 3 ravine. It is about 9 in. wide, runs parallel to the lines of stratification of the gneiss rock, and loses itself in the coffee soil on each side the ravine. In none of the other ravines are there any outcrops of quartz, but there is no reason whatever to suppose that it may not be found in those portions of the jungle bordering the estate which I was unable to examine, and up along the great valley through which the Auldbar River passes.

Chemical and Metallurgical Laboratory, Lime-street, E.C.

WEST AFRICAN GOLD FIELDS.

SIR,—Your columns of mining reports last week contained some graphic accounts of the mining operations now being carried on there under the direction of Commander Cameron—the same great authority, I presume, whose interference and extravagance made such a nice muddle of the Akankoo Company at the outset. The report is about the most amusing of anything that I have lately read—in fact, it beats some of the Indian reports, and that is saying something. The jovial son of Neptune who has secured the command of a quarterdeck on land is evidently the great "I am" of Axim, but appears to have got a little mixed in his ideas. He says, "The shaft from the old vein and bottom I have called Neptune;" it is not very clear whether it is the shaft, the vein, or the bottom which is named after the briny god who is a terror to the new chum crossing the line. "Two other veins are called Jupiter and Venus." "The alluvial for hydraulicising I shall call Tellus; but when, oh, tell-us, do tell-us, whether it will be before or after it is hydraulicised? "In Neptune we have yellow and red marls and clay, which show colour." Well, it is no wonder Neptune does show a little colour when he is daubed over with yellow and red marls. "The grains being fairly large;" what grains? "The yellow and red marls which show colour," or is it grains of gold? If so, what does the jolly captain mean by "fairly large"—anything between a pin's head and his own? "A clay-slate of very recent date" (probably 1881) "and a grey quartzite, which shows very fine gold in what should be paying quantities" (of course it should, but is it?) "And the actual vein, which I have not yet examined;" well, how does he know it is "an actual vein" if he has not examined it? "Jupiter is a fine streaky quartz with red and yellow oxides, and shows out well. Venus is much of the same character—indeed, it is difficult to distinguish between them." Very likely, it is a case of Pompey and Cæsar—Cæsar very like Pompey, Pompey very like Cæsar; can't tell t'other from which. The experienced officer had better take a lunar, and examine Jupiter and Venus with his telescope to make sure which is which; and, when he is certain, had better cover Venus with a plantain leaf and put a bangle on her ankle, or probably the visual organs of the son of Neptune might have been a little disturbed with brine, causing him to see double.

March 23.—"Washing samples of the dirt I am going to work at gives on the surface 10s. to 15s. per ton, and the engine should give 900 tons in a working day of 10 hours." What a wonderful engine to give 900 tons! What of—iron, water, dirt, or gold? "Once I have the machinery at work our expenses will not be 1*l.* a day." Oh! what an economical manager; I wonder what his own salary is? Oh ye Gods! Jupiter, Venus, and the Son of Neptune will probably do all the labour free gratis for nothing. "This, if I have planks and money shall be within six or seven weeks, say, three months." Do not be particular to a month, the shareholders are as patient as lambs. To perform this wonderful feat, gentlemen directors, nothing is wanted but "planks and money." Plank it down, gentlemen, make your game while the ball is rolling—with "planks and money." He will show you the wonders of Africa. Travelling across the dark Continent is nothing to what will be performed at Axim—providing you send out "planks and money." The facetious commander then says "I have been ill." No wonder I am sure, after such herculean efforts. So have I been ill, but the mirth created by reading these novel reports has nearly cured me. "As the cutting of lines goes on we are discovering more and more features of value, and the natives have just pointed out a specially rich place." Are the lines cut in the features of Jupiter or Venus, and in which is the rich spot? "I am sorry to say the Neptune shaft has caved in from water." No great wonder, Neptune is a rather watery subject, but mixing a little whiskey in the water would strengthen it probably, and cause a blow-out instead of a "cave in." "We struck a spring" (probably a spring tide) "and my pump in trying to keep the water down sucked so much that the sides fell in behind the framing." What did the pump suck—air or water? Some pumps have a habit of sucking, which is very wrong on the part of pumps. "The sides fell in"—which, the pumps or shaft?—"and I think it best to abandon it and sink another, where we shall strike the reef on a higher level." *Nil desperandum*, do away with pumps that will suck.

"Jupiter continues to promise well." What has it promised? "And Venus shows visible gold." Where does she show her visible gold in her false teeth? Did the commander see invisible gold, or does he ever see double? "All the beds of the streams carry gold, but much is in the pebbles of the gravel, which require pulverising before washing and amalgamating." Why not send the "pebbles' home and pay dividends with pebbles, each shareholder could then become his own "pulveriser." A dividend of pebbles would be a novelty. "April 1 (a very suspicious day), I have been trying hard to get samples from near the old centre shaft, but though we have traces I have not got at good stuff." What stuff and nonsense; why don't you get at it, if it is there. "The ground has been worked and reworked (a good show for you); the gold is there, but I shall have to work the Tom"—poor old Tom. Is that the favourite beverage on the Coast now, or is it Tom Bowling? "Jupiter and Venus continue to show well, and Jupiter runs right away north with easting to the Ankobra." Jupiter is evidently jealous of the attentions paid to Venus by this model mining manager, and is going off to the Ankobra river to drown his sorrows. The amorous swain should not devote too much attention to Venus, nor leave poor Jupiter to die on the road, as a companion was left once. "Sessense has come in at last." I was in hopes it had been Some-sense, so as the report could be understood. "I hope to have gold to send home from the Tom in two or three weeks." This is about the general wind up of all the model new chum mining managers' reports, who have been experimenting in Africa and India on the "planks and money" the unfortunate shareholders are foolish enough to provide to enable them to show off their incapacity in mining, and to have a good time of it.

The model commander of Venus has left out what should have been made the pith of the report, and from what it appears, he intended to convey, that is the magnificent returns in prospective—very prospective. "Washing samples of dirt, the engine should give 900 tons per day," say, "at 10s. per ton" = 450*l.* per day, or say, for 300 days in the year 135,000*l.*; deduct "total expenses at 1*l.* per day," say, 365*l.*, leaves an annual profit (in prospective) for the admiring shareholders of 132,635*l.* Talk about a picture, why that report should be framed and glazed with this as a key to it, and kept as a memento of the wonderful genius who is going to astonish the natives of Axim. It is to be hoped when the "washing samples," the 900-ton engine, and the old Tom are all ready for operations that the enterprising natives will get up an exhibition to give an effective display of the wonders of the Gold Coast, with the great "I am" in command. I hope the rival of Jupiter and the protector of Venus will be grateful for my attempts to make his report more readable, and the shareholders, I trust, will pass me a vote of thanks for interpreting its meaning. I can easily understand that a man's ideas are apt to be a little confused, and he may be "ill" after the exhaustive work of prospecting Venus at 120° in the sun and old Tom at command.—*May 7.* AXIM

CHILE GOLD MINE.

SIR,—I think your correspondent "Guayana" is mistaken when he states that the expenses of the mine are 4000*l.* monthly, not including the interest on debentures. According to the report which appeared in the *Mining Journal*, the Chairman made the following statement at the last meeting:—"Soon after he went out Mr Nicholson calculated that 2800*l.* per month might be looked upon as the average monthly rate of working expenses."

The Chairman also mentioned that a yield of 1850 ozs. per month would be sufficient to pay a good dividend to the shareholders. So far this year the returns have averaged 1956 ozs. per month.

Hornsey-lane, May 7. O. S

COLORADO UNITED MINES.

SIR, - I shall feel obliged if you will kindly correct in a prominent manner in your next a printer's error in last week's *Mining Journal*, which states that "it is now ascertained that the first and second class ores run from 50 to 100 ozs. per ton." This should be "from 500 to 1000 ozs. per ton;" and even this is actually very much below the real assays which have recently been made both in this country and in Germany, the result of which proves the first-class ore to be—Lead, 32·8 per cent.; silver, 4·3 per cent.; this equals 1541 ozs per ton. Second-class—Lead, 77 per cent.; silver 2·8 per cent.; this equals 1003·52 ozs. per ton.

These results may seem surprising, but when it is remembered that 71 shipments were made to Liverpool, varying from 300 to 700 ozs of silver contents, it will readily be understood that the assay for silver is now much richer in the 13th level than it was some years ago in the 6th level, from which points of the mine the ores which were sold in Liverpool were taken. ARCH. J. SMYTH

Tokenhouse-yard, May 7.

COLORADO—RICO SILVER MINES.

SIR,—The new and rich mining camp of Rico, Southern Colorado, is likely to attract considerable attention during the coming summer. Work has been carried on in the camp through the winter, apparently without much hindrance from the snow. The Dolores News, March 24, says:—"One hundred and twenty jacks loaded with bullion from the Grand View smelter started out yesterday for the end of the track. Each jack carried a couple of bars—almost 200 lbs. of bullion. The animals belong to Love's Train, and it is their first trip for the season."

"One of the most important strikes that have been made in pioneer mining districts for some time is to be credited to the Swansea lode, which is being worked with other properties of the Newman group, under lease to F. W. Reed, from the Marr's Consolidated Mining Company. The strike was made on Thursday morning shortly after the day shift went on, and was in the first level. The width of the streak of this rich ore is 13 in. average, and from it a chunk of solid ore weighing 420 lbs. was taken shortly after the discovery. From this a fair specimen was broken off and taken to Leon Eggers for assay, who gave the amount of precious mineral in it as follows:—891 ozs. silver per ton; coin value, $986·78; 11·49 ozs. gold per ton; coin value, $237·51, making a total value per ton of $1124·29. This is the largest gold assay ever obtained from the mineral from any mine of the group. Mr. Reed says he can pick specimens from the Swansea that will assay from $3000 to $4000 per ton, but his idea is to get a true and correct estimate of the value of the ore he is mining. He has numerous tests made daily, and is thus enabled to know just about what his ore is worth. Ten men are now at work on the Swansea, and the ore they mine is shipped to the Grand View smelter. The ore is not now being treated, but is stored, and the bins already hold about 10 tons of the high grade mineral. The lease extends four months from Feb. 15, during which time the lessees are privileged to drift or sink in any direction, but not allowed to stope a foot of ground. The object is to open up the four mines of the group and give the owners a large amount of stoping ground upon which to operate after Jan. 15. The other mines of the group are producing as usual, and the workings continue in good ore, the Swansea extension particularly doing itself proud."

In reference to the foregoing remarks, as taken from the Dolores News, I desire here to make a correction as to the results of the "Newman Group of Mines" published in the account of my trip to Colorado (paper No. 4), Nov. 4. In giving an account of Rico and writing of the "Newman group" I stated:—"The following returns of ore sent to the smelting-works at Denver, Golden, and Rosita were furnished me by Col. J. R. Crooke, the resident superintendent, and Mr. J. G. Taylor, jun., secretary. Total, 1322 tons 1505 lbs.; value $208,216·02; or $157·42 per ton." I have lately heard from Col. J. R. Crooke that the figures as supplied me by the secretary, Mr Taylor, representing, as I understood, the returns from the Newman group of mines are incorrect, and that the net returns from this group have been about $30,000. I regret that an error should have arisen in any description given by me; but it was no fault of mine I merely quoted figures as furnished me, believing them to be correct I therefore hasten to make the correction as early as possible. The yield as now given me as correct, $30,000, is very good for the amount of development work done, and fully confirms my opinion after visiting the mine that the Newman group of mines is a first-

class mining property, and will be heard of as a large producer of bullion.

As the whole time I was in America was only five weeks, during which I travelled over 6000 miles by rail, coach, or horseback, besides inspecting a number of mines and several mining districts, the Mineral Exposition at Denver, &c., making notes, collecting statistics, and a large amount of information about Colorado and other States I passed through, it will be easily understood that it was impossible for me to verify all the statistics I received personally. I accepted and published such as I believed to be correct. Should any other errors have been made, I shall be obliged if any observer will point them out to me.—*May* 8. THOMAS CORNISH.

Author of "A Trip to Colorado," &c.

BRITISH ENTERPRISE ON THE PACIFIC COAST.

SIR,—I have just returned from a three months' trip through a portion of Nevada and California, and shall send my report thereon as soon as I have had time to complete it. I have many details concerning new enterprises (particularly English companies), such as new mining organisations, railway enterprises, or mechanical inventions.

Mining at the present time is at a very low ebb in this State—in fact, almost as bad as it was in 1868, after which they discovered the famous Comstock Bonanzas; and I am confident that we have as good mines now undeveloped as we had then; we only lack capital to open them. We have a narrow gauge railway running through Nevada from the Mound House on the U. and T. Railroad through Esmeralda County (about 300 miles) down into Ingo County, California, and will connect with the Southern Pacific at Mohave. This road will run through the finest mineral country in the world (gold, silver, and copper), and a short time will show that it will open up new camps equal in importance to the once booming Virginia or Eureka.

An English company have a very fine property here (Esmeralda mining district) bonded, which there is no doubt they will take when the bond expires on May 5. It is the Humboldt West Mine and 20 stamp mill; and another English company are now negociating for a gold mining property in Ingo County, California, on the line of the Carson and Colorado Railway. Americans are now beginning to find out that they cannot fool the English mining investor any longer, but must show him something that has merit before he can get him to purchase. As soon as the Carson and Colorado Railway connection is made with the Southern Pacific Railroad at Mohave, I intend making a trip over it, and to examine all the mining camps on the line of road; and I trust the information I shall send will be of equal advantage to the Pacific Coast, and to the readers of the *Mining Journal*.

Aurora, Nevada, April 19. ——— A. C. MAY.

SILVER PEAK MINING COMPANY.

SIR,—Permit me to give a short extract from the Animas Forks Pioneer which may be of interest to many readers of the *Mining Journal*, and will amply justify all that has ever been said of this splendid property, and foreshadow the character of the report soon to be received from the mines. But apart from the value of its great mineral riches, the fact that an extension of the Denver and Rio Grande Railway from Silverton to Eureka, 5½ miles from the tunnel, will be completed next September, is another important factor in the future of this property. When the prospectus was issued the railway was 150 miles off, and the facilities of transit thus acquired must immensely enhance its value. As to the property itself the editor, an authority in the district, says:—"The success of the enterprise is considered indubitable in the mind of every mining man in this region. The most discouraging and, in fact, the most expensive part of the work is done, for within the next 1000 feet they will cross numerous veins which on the surface show large bodies of high-grade mineral. Prof. Reed, who is now making a thorough examination of the property, seems to have great confidence in it, and though the tunnel's track is covered with snow, he is investigating its advantages when completed as a thoroughfare from its Poughkeepsie end. We hear occasionally that Capt. McFarlane will be local manager of the company's affairs here, and we hope he may, as we feel he is fully capable of conducting its business." Feeling assured that the above extracts will be gratifying to many, I crave a corner for them in your next issue. A. F.

Llanrwst, May 5. ———

MINING IN AUSTRALASIA—DIAMONDS IN NEW ZEALAND.

SIR,—So little is yet really known of the gem products of these colonies that the following statement of "diamond discovery" in New Zealand is just as likely to be true as not in some of the main facts, though "soft diamonds" is a contradiction of terms too hard to be easily swallowed. One thing is very certain that real diamonds have been found in New South Wales, the largest yet discovered being a very pure white stone, which fetched 500*l.* here; besides this there have been several hundreds (if not even thousands) of small ones washed out at Cudgegong and in the New England tin districts, but so far as I can remember none of them of any real commercial value, as though two small parcels were sent to Germany for sale some years back no public news of the result was ever made known, which would have been pretty nearly sure to have been the case had the speculator made a success of it.

Here and there you come across a fairly good stone now and then in the possession of mining men principally, who have either found them themselves whilst washing gold out of the alluvial, or bought them up on the diggings from other discoverers—the finest specimen I have seen personally being a brilliant set in gold, belonging to Mr. B. O. Holtermann, M.P., of Sydney, who found it near his celebrated gold mine at Hill End, and wears it as a souvenir of the (literally) golden years of his earlier life in our Australian El Dorado—for, whatever future discoveries may lead to, we cannot as yet rival Golconda, through my late friend, the late Rev. W. B. Clarke, the greatest geologist Australia has yet seen, always predicted rich discoveries would yet be made of precious stones, particularising rubies, diamonds, and emeralds more especially.

A few weeks ago, says the New Zealand Herald of Jan. 22, a report was telegraphed from the south that a Mr. J. S. M. Jacobson had found what he believed to be diamonds in Canterbury. The report, however, stated that some of the stones were soft. A worthy old Auckland settler, Mr. Archibald Douglas, who has travelled a good deal, like most Scotchmen, and been where diamonds were discovered in a natural condition, has picked up a few stones on a road he has had occasion to travel frequently of late. The stones he has found are all diamond shaped, but comparatively small. The first thing that attracted his attention to the crystal-looking specks on the road he was traversing was, one morning, after a heavy rain, he found one of them lying on a blade of grass. The blade of grass did not appear to be weighed down by it. He stooped and picked it up, and on examination found it to be diamond shaped. A further search in the neighbourhood put him in possession of a number of these bright stones. On reaching home he examined them more carefully, and found that they were lighter than water. He tried broken glass and small pieces of quartz, but in every case these immediately sank to the bottom when placed in water. On the next and subsequent occasions that he passed the same place he has always picked up a number of stones of a like character. All were diamond shaped, and all possessed the light specific gravity. He subsequently obtained some strong sulphuric acid, and immersed a quantity of these stones in it, and after an immersion extending over 12 hours, found the stones, instead of being destroyed, much brighter in appearance, and some patches of discolouration on some of the stones when placed in the acid where removed by its action. On Saturday last he showed us some 20 or 30 of these stones, and certainly they possess the outward characteristic of diamonds. Where found the diamonds appear to have been washed down by the rains; but in the neighbourhood is what appears to be an old volcano, the outline of the crater being still distinctly visible.

Mr. Courtney, a returned diamond miner from South Africa, has has an interview with Mr. Douglas, and examined a large number of the specimens in his possession. Mr. Courtney has picked out several pieces which he is sure are diamonds of fair quality, though very small; but the greater number of the white stones in Mr. Douglas's possession he has pronounced to be white carbon in the process of formation into diamonds. In South Africa this white and crystalline carbon is called "the father of the diamond," it being the belief of the miners there that all these pieces only want a sufficiently long continuance of the conditions which brought them into existence to convert them into the exceeding hard and valuable gem which we know by the name of diamond. In South Africa these pieces of white carbon are found in abundance in all the diamond mines, a circumstance which the miners there always regard as a favourable sign. To show the softness of some of these crystalline pieces of carbon Mr. Courtney took up some that appeared to Mr. Douglas as good-looking stones, and crushed them easily with his teeth. According to Mr. Douglas's statement, the whole of the pieces he had in his possession were found in this province, within about 100 miles from Auckland, and according to Mr. Courtney some of these pieces are undoubted diamonds, though small. Mr. Peacock tested some of the pieces in Mr. Douglas's collection, and found them not diamonds, which would agree with the result of Mr. Courtney's examination. The stones were gathered by Mr. Douglas about three years ago, and he had kept them in his possession since then, thinking that some day he might be able to prove what they were, and benefit to some extent by his discovery. The discovery was made on private land, and this, of course, somewhat complicates the negociations until such time as it is known whether the owner would be willing to deal fairly and liberally with the discoverer. R. D. A.

Sydney, May 27. ———

LAKE SUPERIOR COPPER MINING.

SIR,—The valuable letters of Mr. J. Daniell, which appeared in the *Mining Journal* of April 28 and May 5, will be read with much interest by those interested in Lake Superior copper mining. As Mr. Daniell was good enough in his last letter to furnish a full and satisfactory explanation respecting the cost of mining at the Osceola Mine for 1882, in reply to my letter of March 24, perhaps you will kindly allow me to say that the basis on which my calculations were made was taken from information given in a report on the Longfellow Mines of Arizona, made by Mr. Arthur F. Wendt, of New York, in January, 1880. My mistake arose through assuming that the percentage of the yield of 1882 was the same as that of 1879, as stated by Mr. Wendt.—*Altrincham, May* 9. R. MEIKLE.

MINERAL RIGHTS IN PORTUGAL—RIGHT OF THE CROWN TO MINERALS.

SIR,—Having just seen in the *Mining Journal* of April 28 a letter from Mr. J. S. Trotter on this subject, which ought to be of much interest to all connected with mining, and although the terms and conditions cited in the letter upon which mines are held in Portugal are not altogether accurate, attention to the customs prevailing in this and other countries is desirable, especially in the event of legislation taking place at home for the protection of the industry.

As a land and mine owner in Portugal I am able to add to the observations of Mr. Trotter, and I beg to remark that by no means would I recommend the adoption of the mining law of the country in its entirety. In Alemtejo there are large proprietors, but in most other parts of Portugal the land is chiefly owned by peasant proprietors, and a modern claim of 1000 metres by 500 metres (113 acres) may contain the fields of a score of the latter. To obviate the difficulty of treating with so many individuals the Crown grants the right to a concession, as stated in Mr. Trotter's letter, but retaining the right to 5 per cent. on the net profits; and by a recent law, dating from Dec. 31 last, increasing the annual fixed payment on the area granted to about 1s. per acre. The proprietor of the soil is entitled to 2½ per cent. on the net profits, and for surface damage, as given in the letter referred to, which is equivalent to 21*l.*, 43*l.*, and 53*l.* odd, leaving out shillings and pence. That is probably correct as regards common and agricultural land in Alemtejo, but in Central and Northern Portugal irrigated land, producing maize, growing vines, or producing timber, will cost 120*l.* to 200*l.* per acre.

The register of a claim is very cheap and very simple, but at the expiring of eight months you have to deposit about 30*l.* on applying for a provisional concession, and before you get a definite concession a considerable period must elapse; while waiting for it any mineral discovered cannot be removed or sold. Plans, reports, and accounts have to be furnished yearly to the Mining Department, and there is seldom any difficulty about the settlement of the 5 per cent. and 2½ per cent. dues to the Government and landowner.

Palhal, Portugal, May 4. ——— WM. CRUICKSHANK.

IMPROVED IRON AND STEEL PROCESSES.

SIR,—In an article recently published in the *Mining Journal* much is said about the honour due to certain inventors for the part they have played in connection with the improvement of the processes used in manufacturing iron and steel, but as some of the processes do not appear to have quite so much novelty as is claimed for them, I trust you will permit me to refer to an invention patented by my late brother, Mr. William Mickle, then resident at Wellington, Durham, so long since as August, 1855, and which was fully noticed in the *Mining Journal* at the time. In a circular which Mr. Mickle issued to the ironmasters in the following year the merits of the new process were also very carefully explained, and it is but justice to his memory that his name should be at least mentioned in connection with honours recently conferred. He remarked that in the present mode of iron smelting there is an enormous proportion of the fuel which the coal contains altogether wasted, and the early adoption of a process to prevent this waste is clearly of much moment to the manufacturer and the community. He proposed, in the first place, to divide the coal by dry distillation, and then use the gas and coke produced as fuel to smelt the ore. The coke (he continued) may be charged as usual, while the gas is conveyed from the gasometer in pipes and pumped into the furnace. The gas-pipe can either be introduced into the air-pipe near the furnace or the gas itself forced through separate pipes and tuyeres. The former is the more readily effected. At the mouth the gas-pipe ought to be 1-5th to ¼ in. inside diameter according to quantity. The heat from the oxy-hydrogen blow-pipe is well known—it is inferior only to the solar heat, or to that produced by electricity. It fuses the most refractory substances, and even renders some gaseous. The plan infers the use of a blow-pipe—the heat will necessarily be most intense and the fusion of material rapid. An eminent ironmaster and scientific chemist considers that 1-5th of the gas would cause his furnaces to yield 50 per cent. more of metal, the gas flame in the upper part of the furnace facilitating the reduction in the hearth, the quality of the iron being also improved. Dr. Richardson, of Newcastle-upon-Tyne, a chemist of high standing, expresses an opinion that "the working of the furnaces would probably be so rapid that the hearth would, within 12 hours, require frequent tapping, yielding a superior quality of iron." The heating of the air-blast may either be continued or not; if continued, it will add to an already extraordinary heat.

By dry distillation, as there is no waste, all the carbon and hydrogen are obtained less 1¼ of the latter, which combines with the oxygen, &c., or, reckoning carbon into hydrogen, it is equal to 94½ per cent. of the former. Whether coke is made in ovens or retorts it contains the ash, and moisture from cooling (say) 3 to 5 per cent. It is to be questioned whether coking in ovens yields on an average 60 per cent.; but, taking it so—comparing it with the above, and adding ash and moisture to equalise, 94½ + 3½ + say 4 = 101¾, less for tar and hygrometric water 7¾ = 94, or, in other words, there is obtained from coal equal to 94 per cent. of coke instead of 60. Trials in ordinary gasworks, with two different coals, results which left no room for doubt. In three essays best coal gave nearly 2 cwts. gas per ton of coal, 81¼ per cent. strong hard coke cooled without water and a little small coke, and 86 per cent. with water and a little small coke. In the 4th essay, 11,650 ft., or 3 cwts. gas per ton; 75 per cent. large coke, cooled with water; and 3 per cent. small coke = 78 per cent.; and in two other essays secondary coal, 11,450 ft., or 3 cwts. gas; 75 per cent. strong hard large coke; 8 per cent. small (would do for retort fires), cooled with water = 83 per cent.

Mr. Mickle pointed out that the fuel of the heating stoves will be nearly the same as, or more than, that for the retorts and small engine; the capital for gasworks and the cost of manufacture equal to, or less than those for coke ovens. Coal gas, purified as ordinarily, will be found the purest fuel since charcoal was abandoned in this country. The average cost of fuel may probably be 22s. 6d. to smelt a ton of metal; but supposing 1½ ton coke be used at 12s. = 18s.; then 1½ ton coal at 6s. 6d. per ton, and net cost of carbonising, &c., 1s. 6d. = 8s. = 12s.; saving 6s. In a large furnace, yielding at present 1 ton of metal in the hour, then 1½ ton coal at 9000 ft. gas per ton = 13,500; at 120 oxygen × 5 = 81,000; using 5000 ft. air per min. = 300,000. The gas thus consumes upwards of one-fourth of air. The air required to ensure complete combustion in such a furnace would be about 15 tons—it receives at the above rate 11¼—and thus one-half of the coke passes off as carbonic oxide. To prevent explosion the pressure of the gas should be maintained as high as, or slightly in excess of, that of the air—pressure gauges may be attached to the pipes of both—valves opening only to the furnace placed in the gas-pipes—and taps placed as closely into the furnace as possible, and turned off immediately before the engine ceases to pump. Proper attention to the pressure and taps will, from the experiments made, prevent danger. It is reasonable to expect that, coupled with purified fuel, the intensity of heat will more effectually separate the iron from the slag, and *vice versa*, thus improving quality, and, besides the saving from economy of fuel, cause the production of a much larger quantity of metal.

The circular from which these extracts are made having been issued but little more than a quarter of a century since, it is scarcely fair that it should be entirely ignored and an almost identical invention praised as a new discovery, and made the basis for social honours being granted to an imitative inventor.

Newcastle-on-Tyne, May 7. ——— JUSTICE.

LONDON COAL SUPPLY

SIR,—*En résumé* of my contribution to the Journal of April 21, desirous of conciliating all vested interests, the transport from the collieries to the Forth will be effected by rail at current rates, proposed traction engines being exceptionally brought into requisition where railway communication does not exist, or as feeders to same. The minutes of evidence in the Scotch Railway Bills before Parliament this (1883) session show the output in the case of existing collieries can, with the greatest facility, be quadrupled, irrespective of a very large unworked coal field in process of development. The largest coalowners with access to the Forth aver they have been unable for several years to make any profit, and that their trade was never in so depressed a state as at present, to whom it will be of deep interest to learn that, based upon a delivery price into consumers' premises in London of 15s. a ton, with 6s. a ton at pitmouth, by no means at shipping port, a dividend on paid-up capital of proposed company will accrue of upwards of cent. per cent., with a corresponding remunerative distribution at a cost of 7s. and 8s. a ton at pitmouth. By sinking less than a moiety of said profit, equivalent to the entire existing sea and railway charge all such existing transport will be irreparably displaced.

As a proof that this view is supported by the highest authorities in this speciality, editorial articles of the leading organs of the coal trade, *Mining Journal* and Colliery Guardian, with the no less weighty ægis of the Engineer, give expression to the identical consensus of opinion, one of them stating—"proposed system will extinguish existing rail and sea transit to London, and revolutionise the London coal trade." The import into London last year was 10,380,775 tons, constituting the largest transport in the world.

The Midland and Great Northern terrific loss, at the rate of 300,000*l.* a year in the carriage of coal to London, *vide* the Times City article, June 5, 1871, did not involve a greater reduction of their coal rates to London than 3s. 1d. per ton, *vide* Mr. Allport's evidence on March 25, 1878.

Mr. Allport admitted, before a Parliamentary Committee, on March 25, 1878, that the Midland shares fell from 190*l.* to 92*l.*, consequent upon their contest with the Great Northern. The statement of the Chairman of the London and North-Western in October, 1871, of Mr. Allport on June 9, 1865, of the general manager of the Great Northern on April 11, 1878, of the Chairman and general manager of Great Eastern on March 8 and 9, 1878, of the largest London coal importer on April 2, 1878, of the leading railway counsel on April 5, 1878, and other evidence of too prolix a nature, prove the impossibility of railways attempting to compete with water transit.

It may be deemed supererogatory to dilate upon the well-known immense advantage possessed by steamers of the largest cargo capacity in the coal trade, especially to London, where the import last year, according to precited official returns, amounted to 10,380,775 tons, the largest transport in the world, which will be greatly augmented with a reduction in price to the consumer. Sir Edward Watkins' evidence before a Committee on the 1871 Coal Bill demonstrated "the immense influence of a reduction on price on the consumption of coal, amounting in a very few years in London to an increase of 600 to 700 per cent."

What must be the increase with the inauguration of a system of sea transport, which for want of water cannot, as an absolute, indisputable fact, supported by official data, be carried on from the Tyne or any north-eastern port, or from Grimsby or Hull, where the actual land lead, per official returns, ranges from 41 to 58 miles, the greater part the extreme distance, which to the Forth descends to under half a mile, the mean being far below any other coal field. The Forth is the only river from which such can be effected, as, according to the most recent Admiralty chart, there is at St. Margaret Hope, above Queensferry, 17 to 31 fms. at low water, and below Queensferry 36 fms. and upwards. Having under the cholera visitation performed quarantine, as passenger from Northern Europe, at St. Margaret Hope during six long weeks, I can vouch for the sheltered position for transhipment of coal from barges, which will load in Grangemouth, &c.

Steam coal will find a ready market in France at highly remunerative prices, the largest, oldest, and wealthiest firm of coal importers and merchants in Paris; simultaneously colliery owners in Belgium possessing the largest waterside coal wharves, provided with tramways and trucks, with the largest number of horses and carts, penetrated with the conviction that English coal by means of proposed conveyance can be delivered in Paris much cheaper than indigenous or Belgian coal, are prepared to act as the company's agents, and to guarantee all sales. The late Mr. Seymour Clarke, general manager of the Great Northern Railway Company, writes thus as to the supply of Paris: "The coal traffic to Paris may be carried to any extent, your calculations showing a very great reduction upon existing high price." Most favourable reports are extant from the late Mr. Thos. Brassey and other high class practical sources. A French Government report shows that "the entire supply of Paris with English coal resolves itself into a simple question of reduced cost of transport." The *Mining Journal* of Aug. 5, 1876, states—"With a reduced cost of transit it is practically impossible for Belgian coal now supplying Paris to compete with English." The result of a meeting at the office of the Chairman of the South Yorkshire and North Derbyshire Coalowners' Association shows that English steam coal was selling currently in Paris at 48s. a ton, identical quality and category, only costing under 26s. delivered to consumers' premises, by proposed system." The enormous proportion of slack, smudge, or small in the Belgian and French outputs renders the large coal much dearer at the pitmouth than English coal delivered in Paris by proposed system; whilst the largest colliery and screw collier owner in the United Kingdom states—"Your system of supplying Paris with English coal is the only feasible one."

As to the supply of steam coal to the Baltic and elsewhere, the cost of the coal f.o.b. in the Forth, combined with the incomparably lower working expenses of the much larger cargo capacity of the steamers, renders competition impracticable from the Tyne and Humber ports. With the decrease of fish and mineral oils, and consequent difficulty in obtaining illuminating and lubricating agents, petroleum was discovered in the United States. A parallel to such a blessing bestowed upon a nation in the hour of her direst necessity it is difficult to find, except in that of a vastly reduced cost of fuel to the agglomeration of the less favoured classes of our huge metropolis constituting the preponderating mass of the consuming public, a leading member of the Coal Exchange stating in evidence before a Parliamentary Committee, "The bulk of the consuming public will not look at the relative value of coal, but buy simply what is cheap." To afford time for the practical development of this national undertaking, a commencement is proposed to be made with a capital of

350,000*l.*, in shares of 10*l.* each, with power to increase. No promotion money will be paid, the capital thus remaining intact, but the founder and managing director, Mr. W. J. Thompson, will, for his services in connection with the inception and establishment of the undertaking, receive, subsequent to distribution of a dividend of 10 per cent. per annum, a moiety of surplus net profits, the shareholders acquiring the entire first net profits in each year up to 10 per cent. on their paid up capital, and 50 per cent. beyond said 10 per cent. Prudence dictates the progressive development of an undertaking replete with every element of success enhanced by being placed beyond the region of competition as previously set forth.

Little Tower-street, May 7. —— W. J. THOMPSON.

THE READWIN AMALGAMATION PROCESS, AND AFRICA.

SIR,—Allow me space for a few words in the Journal in connection with my process of amalgamation, and African minerals. I was recently entrusted with 20 tons, or thereabouts, and requested to extract the gold therefrom. This rather large sample of quartz had previously been crushed, sampled, and assayed by a firm in London, put into fresh bags (497), securely fastened, and sent down without interference to me, at East Greenwich, for amalgamation. These bags were indiscriminately opened as they were required, and their contents spread out thinly upon the sample tables. It was soon discovered that bits of metallic zinc, tin, lead, plumber's solder, and zinc and iron nails had by some means got amongst the crushed mineral; some of the first three metals being in a graduated state. Clearly it would be thought an odd quartz vein that held such metals in a workable condition, and still more odd to find it holding in addition a liberal crop of palm nut kernels divested of outer covering, and, withal, covered with not palm oil but another sort of oil. The heavy kernels, irregularly enough, were as nearly as could be the size of the bits of crushed quartz, and enveloped so completely with ore dust that no unsuspecting eye could distinguish them. Now it happens that the apparatus was not designed for expressing oil from vegetable substances, and certainly not from palm nuts, for it is a fact well known that palm oil, as well as other oils or grease, has no friendly disposition towards mercury in its relation to gold amalgamation.

Fortunately neither oil in excess, nor the metallic substances above named vitiate my operations. The progress of grinding, however, was considerably impeded by the pestles having to run partially over beds of crushed kernels that had formed at the lower part of the pans, which prevented, also, some of the gold from reaching the mercury. On clearing up, at the end of the operation, it was carefully estimated that something like half a bushel of these offending kernels (if not mineral vein produce) must have been introduced into the ore bags, particularly as they were sometimes found at the mouth of the bags. On distillation of the 80 lbs. of mercury used (which remained, as it always does, bright) more than 40 ozs. of mixed metal was obtained, which on melting gave 37 ozs. of white alloy, consisting chiefly of zinc, lead, tin, and gold with a good deal of arsenic in the slag. The alloy, on cupellation, yielded a profitable quantity of gold of superior quality, about 90 per cent. of which was obtained at the first operation though so unexpectedly impeded. About 5 per cent. of the bulk of the tailings was redone by the same process exactly (minus kernels, &c.), and the gold extracted leaving not a trace of gold discoverable in the residue by fire assay, proving conclusively that by my simple process I should have literally extracted the whole of the gold contained in the mineral at the first operation but for the extraneous introductions aforesaid.

Reverting to my note in last week's Journal, as to the applicability of my method of amalgamation in India, allow me to say that I have not yet dreamed of any supercession of the well-known and effective contrivances for the reduction of large quantities of what are called "free milling" ores. Neither has great expedition been in the least pretended for my miniature vortices. The operation happens to be intentionally and reasonably slow and remarkably sure, two features preferred by some experts to more haste and less gain. The primary object, all along, has been the treatment of low grade auriferous mixed minerals, blanket sand, tailings, &c.; all of more or less value—generally less. True it is that my method and portable apparatus will not satisfy some folk by getting the ultimate gold particle. That, probably, will never be done by any amalgamating machinery, extant or devisable. T. A. READWIN, F.G.S.

London, May 8. ——

MINING MACHINERY FOR INACCESSIBLE COUNTRIES.

SIR,—I have perused Mr. Marsden's letter in last week's Journal under the above heading, and although I can speak highly of his stone-breakers, I question very much the probability of his pulverises being capable of reducing auriferous quartz to a sufficiently fine powder to admit of the whole of the gold being extracted without any further crushing, and if this should prove to be the case, either stamps or other machinery will be required for completing the operation. I doubt if "H. G. T." will obtain sufficiently reliable information by consulting the illustrated catalogues of manufacturers, as such documents are generally drawn up in far too sanguine a spirit. He may do much worse, however, than consult the San Francisco or New Jersey manufacturers of machinery for reducing gold and silver ores, as some of the well-known firms in these cities have had great experience in preparing and erecting gold and silver reduction works. For more than 20 years I have been engaged in the management of mines, and the supervision of such machinery, and I am aware of no better or more reliable makers than the well-known firms in the above cities, where first-class mills and materials can be obtained and made in sections not exceeding 250 lbs. each. For inaccessible districts, I would recommend that a single stamp should not exceed 600 lbs.—*Scorrier, May 9.* —— GOLD MINER.

ROCK-DRILLS—WITHDRAWAL OF CHALLENGE.

SIR,—So far as our memory serves us, we have never known or heard of either Mr. Penrose or Mr. Wendelstein in connection with rock-drills, or in any other connection whatever, and we are not at all disposed to argue the matter with novices. Mr. Penrose's mystical allusions are not comprehensible to us. When he speaks of having been inclined to laugh at the drawings of the Dubois-François machine we wonder that he did not continue to incline, and if his risibles were sufficiently tickled, following the example of his "professional colleagues," actually laugh outright. He speaks of the knowingness of Cornishmen. We frankly admit they have had plenty of time to learn something about rock-boring, and that they probably do know as much as any mining people concerning the use of the elbow mechanism. It is a wonder that they do not use their hard heads as battering-rams to try to bump the rock down, and claim that a great Cornish invention has been made. It is quite within the possibilities that we shall some day furnish boring machines to the Cornish miners from America, sending along with them some *Yankeeised* Cornishman, who will know how to make use of the brogue and other necessaries to encourage them into swallowing the bitter pill. But after all we should require to reflect a little in order to decide whether it would be advisable to commence the sending of machines first to Land's End or to Patagonia.

We have spent 16 consecutive years trying to introduce boring machinery into that little tag end of creation called Great Britain, but with no satisfactory results. We intend, however, to follow up Mr. John Bull, and should we not have better success soon, we will endeavour to work the oracle, and during the next vacation of Parliament try to get a post card from "the grand old man," with an idea on the back of it. As to the metals used in the construction of our machines we have always reserved to ourselves the right to dictate what kinds of metals should be used and from what sources they should be supplied; moreover, we always had all our own designs, working drawings, models, and patterns (with trifling exceptions as to the latter) made by one and the same engineer, who has been in connection with us for at least 14 years out of the 17 during which we have been occupied with the question. The simple fact of our having, on April 29, 1875, received an order from Mr. Favre, the contractor of the St. Gothard Tunnel for 60 machines, is sufficient answer as to our position at the St. Gothard Tunnel during the lifetime of Mr. Favre. The extract in the Journal of April 21 was taken from the official report of the Swiss Federal Council to the Powers interested in the tunnel, and was no personal certificate to us whatever.

As Mr. Penrose speaks of his "professional colleagues," we are struck, amazed, and wonder that he does not furnish some mystical signs to follow his name, in order that we may try to understand something more of the mystical, mythical, and mythological Henry. Just here we are tempted to quote the proverb "Answer," &c. As it appears evident that the majority of the principal rock-drill proprietors have no intention of entering into a competitive trial with us we hereby withdraw the offer which we made on March 10. We find that in our last article we quoted correctly the figures stated by Messrs. Holman Brothers, of 4680 in., instead of 3680, as printed.

Paris, May 10. —— MACKEAN AND CO.

ROCK BORING MACHINES—COMPETITIVE TRIAL.

SIR,—I have read with interest the correspondence relative to the above for several weeks past, hoping that the trial proposed in the first instance by Messrs. MacKean and Company would be satisfactorily arranged, and that the Excelsior rock-drill might have had an opportunity of showing what it could do against its more expensive and complicated rivals, but unfortunately it seems as far off as ever, and unlikely to take place at all. Considering the great importance of this subject to the mining community I think it a great pity that the trial should fall through entirely, and should, therefore, be very glad if a committee of mining engineers would take the matter up and themselves arrange for a competitive trial to take place in some tunnel or level, each machine drilling for either one, two, three, or more shifts. This would be a much more satisfactory and reliable test of the comparative efficiency of the different drills than in the so-called competitive trials which have hitherto taken place, where the time allowed for drilling has been about five or ten minutes only. Should such a trial take place full particulars of the conditions to be observed at the competition should be given to each of the competitors, and their strict observance insisted upon.

Amongst other points these should be clearly set down:—1. The pressure of air to be employed. 2. The diameter of holes to be drilled; this diameter should be taken at the bottom, and not at the top of the hole, as otherwise there is nothing to prevent any of the competitors from starting the hole the requisite size, and then putting in a very much smaller drill, as I have more than once seen done. 3. That no more than two men be allowed to each drill. 4. That the drills be all mounted and worked upon the same boring bar, the diameter being given to enable the competitors to get a clipper made to suit same. 5. That in case the machine gets out of order during the trial the time taken to put it again in working order be counted in the time allowed.

Of course there will be other conditions to be observed, but I mention these as some of them seem to have been entirely overlooked in previous trials. Such a trial would be much more satisfactory than that proposed by Messrs. MacKean and Co.; and they, if they have the faith in their drill that they profess, could enter their machine in the contest, and would have the advantage of being upon equal terms with their rivals, instead of binding themselves, upon pain of forfeiting 100*l.*, to drill twice the amount of any other drill. If a trial of this kind is arranged I firmly hope and expect the Excelsior valveless drill to give a satisfactory account of itself.

Chester, May 8. —— J. H. WYNNE.

CONTINUOUS JIGGING MACHINERY.

SIR,—After a careful perusal of the discussion emanating from Mr. Argall's cleverly-written paper read at the Mining Institute of Cornwall on this subject I fail to find a valid reason put forth why the principle of jigging that gentleman is so able an advocate of should not be applied to tin dressing. Capt. Teague expressed doubts as to its success with that particular mineral, but gave no reason why it should not be. The sensible remarks that fell from Mr. Frecheville, H.M.'s Inspector of Mines, were in favour of its introduction, and altogether the discussion did not in the least detract anything from the intrinsic value of the subject as being one well worthy of the impartial investigation of tin miners.

We have it upon no less an authority than that of Capt. Southey's that the principle is right, and will answer for tin dressing. This gentleman speaks from experience, as he has tried the machinery in question and proved to his satisfaction its success in effectiveness, and moreover in a vast saving of cost. These statements cannot be taken as a boast, as the same gentleman is erecting similar machinery again at Wheal Jane to that which was doubtless thrown aside through a something which ofttimes robs a class of people of their faculty of sight-prejudice. Capt. Southey's deserved reputation as a miner leaves no doubt but that he knows what he is about in again erecting this class of machinery, and from the great advantages which are likely to accrue therefrom to tin dressing it would be wise for other gentlemen in a similar capacity to that of Capt. Southey's to divest themselves of all prejudice, and follow his example.

Continuous jigging machinery applied in dressing other minerals than that of tin in England and many countries abroad has proved eminently successful, and great credit is due to Mr. Argall for the able manner in which he has so prominently brought forward a question of such vital import to all miners, especially those of tin. It is to be hoped that the matter will not be allowed to drop, and that the principle, in accordance with Mr. Argall's suggestion, will be fairly tested. Should it prove a success Messrs. Southey and Argall may be justly classed as two of the pioneers of tin dressing. It is not difficult to understand that a reduction of even 25 per cent. in the dressing cost of our large tin mines would materially increase the returns and greatly enhance their value. WILLIAM NINESS.

Perranporth, May 9. ——

EAST WHEAL ROSE.

SIR,—As a subscriber to the *Mining Journal*, and an original allottee in this mine, permit me to offer a few remarks on the property, in the hope that *bona fide* investors therein will take timely warning, and not be led astray by interested adverse statements. About this time two years back the same game was played by the same gentlemen, and as the mine was then in an undeveloped state (its present undoubtedly promising condition not being known) it is to be feared many parted with their shares who have since had cause to regret it. In March, 1881, the writer, a little scared by the false reports, wrote to a London sharebroker asking his opinion. I have before me his reply, which is as follows:—"In reply to yours of the 7th inst. concerning East Wheal Rose Mine, we beg to state that the mine was simply given over by the old company because it got flooded, and they could no longer work it; if they could do nothing no one can. Is it likely that such a mine, worth a dozen gold mines, would be allowed to remain idle if it could be unwatered. If you hold any shares I would advise you to sell out and buy in." Here he names some pet schemes of his own, but this opinion had a contrary effect; in fact, completely changed my mind to such an extent that I have not sold a single share. Here was evidence given by one who was no friend of either the mine, the new company, or the shareholders, that it was worth a dozen gold mines, if it could be unwatered; recent events have shown that such can be done, as I knew would be the case from practical knowledge of engines, pumping machinery, &c.

There is every evidence of an abundance of ore, not producing potter's lead, but silver-lead of a very rich quality; in addition the leases have nearly 19 years to run, the royalty is only 1-18th, there is close upon 1000 acres of ground. A branch of the Great Western Railway runs through the sett, with sidings right to the mine, thus reducing carriage of ores, &c., to its minimum. Compared with some mines this advantage is equal to a dividend in itself. Practically there are three mines, the Central, North, and South, and if, with the primitive machinery formerly employed, they could produce an admitted 500 tons per month, and in a period of 13 years only pay close upon 300,000*l.* in dividends, or over 2000*l.* on each 50*l.* share, it is next to a certainty that with the magnificent engines and other necessary machinery the present company have acquired, they will be able to produce 1000 tons per month, which, at the low price of 12*l.* per ton, would be 144,000*l.* per annum. Assuming the costs to be 7000*l.* per month, this would leave a profit of not less than 70,000*l.* per year. This is no fancy calculation, the produce is quite possible; the ore is worth more than 12*l.*, and working and other expenses are fixed at the highest. Thus it is clear that at par there is not far off 70 per cent. per annum, and should they go to 10*l.* they would still pay 7 per cent. Seeing all this is the reason I have not sold any shares, and do not intend. Much has been said of what the promoters gave for the mine and what they sold it to the shareholders at. If A buys a diamond for 10*l.*, and it turns out to be worth 100*l.*, can anyone blame A for asking and even taking 50*l.* for it? Certainly not. My advice is do not sell, wait until points now looked anxiously at are proved, and you will be well repaid. We are on the eve of a great success, a few months longer and you will without doubt be as well rewarded as—

May 8. —— BONA FIDE INVESTOR.

PERRANZABULOE MINES.

SIR,—With much pleasure I read the remarks of Mr. Niness in your last issue respecting the above mines, and agree with him that the district is as rich for lead as the famed St. Agnes is for tin. The reason for seeing so many mines in the district thrown idle is easily made out. I have had interests in several of them adjoining East Chiverton, as well as in that mine (which is without doubt that which will restore the prestige of the Perranzabuloe district before long). The simple reason for so many knocked bals in the district is not any want of mineral but of capital, and the total failure of limited companies to open out the mines. The successful mines of the district have been Cost-book, the failures limited companies, started with fair prospects and great promises; but the capital, owing to many causes, being exhausted before any depth was attained, and the shareholders failing to provide more, the inevitable end—a wind-up—came to each in turn. This accounts for the many promising mines in this district being idle.

Had not West Chiverton been a Cost-book mine the 160,000*l.* profit would never have been made from between the 80 and the 130; and had not East Chiverton been one, the present promising position of the mine would never have been attained. I went into East Chiverton some years since after careful consideration of its prospects and the reports of disinterested experienced mine agents. I am yet a shareholder, and shall soon be the largest holder in the mine. Having last month visited the mine on behalf of the committee, and fully inspected it for their information, I feel gratified that we possess such a mine, the immediate prospects of which are of no ordinary character. The fact of being a Cost-book mine is a point in its favour as being carefully managed, all costs being charged up, and the protection of "one and all" afforded by the Cost-book System being fully assured, we run no risk as adventurers.

Another point is the small number of shares, all held by responsible persons. Of this we shall see the importance when dividends are being made. It often seems strange to me that investors lose sight of this point—the number of shares a company is divided into. We find similar properties with shares quoted at same prices, one having 10,000 shares, while the other has 100,000, or (say) ten times as many. Do investors ever think of the difference this makes in division of profits. The price of lead is low, but in East Chiverton the ore is not simply lead ore, it is highly charged with silver in the caunter lode lately cut at the 100. The ore assays at 40 ozs. of silver to the ton, while in the old east and west lode it assays 25 ozs. to 30 ozs. to the ton of ore. With this produce, careful management and sound Cost-book working, East Chiverton is sure to "make history."—*Stanley, May 8.* —— J. BARRON.

POLCREBO TIN MINE.

SIR,—The progress in working of this mine is exceedingly satisfactory; it appears to be merely a matter of little time to get Highburrow shaft down to the 30, and the level opened, after which, no doubt, large reserves of tin ground will be laid open. The continued improvement in the lode as developed is an evident proof the tinstuff is getting richer, which speaks well, and corroborate former reports. The driving of the 30 east is a most important piece of work to meet with the junctions of the lodes, which have been so rich in the shallow levels. And from the remarkably cheap way in which this mine can be worked it must leave a handsome profit. The monthly sale of tinstuff clearly shows the rich character of the lode. In addition to the above, there is the intersection of the south lodes. We expect soon to hear important news. J. R.

Crowan, May 9.

TREVAUNANCE UNITED MINES.

SIR,—My attention having been called to a discrepancy in the plan published in the *Mining Journal* some 14 days since, will you permit me to say that the Wheal Friendly lode in this sett is sometimes called the Wheal Pie lode, and is so described in the plan adverted to.—*Walbrook, May 10.* FRED. J. HARVEY.

FRAUDULENT CREATION OF SHARES.

SIR,—Enquiries having been made as to our mode of procedure with regard to the transfer of shares in West Kitty, permit me to say that when this company started one of the first acts of the committee was to lay down a rule that they should have placed before them every month full particulars of all shares changing hands, so that they might be able to check the accounts. Their reason was that they considered themselves responsible to the shareholders for the accuracy of the "Share Register" in every particular.

Walbrook, May 11. JOHN B. REYNOLDS, Chairman.

STOWMARKET EXPLOSIVES COMPANY.—The works of this company were visited on Saturday by a number of gentlemen representing various Government departments, or otherwise interested in the use of explosives, when the Chairman, Major N. D. Garrett, and the chief chemist and works' manager, Mr. W. F. Reid, showed them through the building, and explained the various processes. The guncotton works were first inspected, and there the visitors saw the cotton waste cleansed, prepared, dried, and afterwards dipped in the acids. They then followed it in the processes of washing, boiling, and disintegrating in poachers, after which they saw it finally washed and the water expelled to a certain extent in centrifugal machines, ready for the hydraulic presses, in which it was pressed into discs, cubes, cylinders, and other shapes, according as it was intended for torpedo or various blasting purposes. The guncotton leaves the hydraulic presses still containing 25 per cent. of water for safety in storage, according to Government requirements. The "E. C." powder, which is this same guncotton carried a few stages further, and thus ingeniously rendered available for use in small arms and sporting guns which, in the ordinary condition of guncotton, it would burst. In making the "E. C." powder the guncotton pulp is mixed with certain nitrates and other chemical constituents in an incorporating mill. The powder thus produced is then placed in a revolving granulator, where the particles of powder cohere, and after being subjected to the revolving action for a certain length of time and at a given speed, are removed from the machine in the shape of small granules. The powder is then taken to drying-houses, where it is dried in trays by artificial warmth, after which a chemical liquid is added to it in certain proportions, which hardens the granules and imparts to them a yellow colour. The powder is finally dried in trays, and afterwards packed in tins for the market. The special features of the "E.C." powder are that it produces no smoke, a scarcely perceptible recoil, and does not foul the piece like ordinary gunpowder. The experiments made for the purpose of demonstrating the power, safety, and other qualities of the company's explosives were particularly interesting. Charges of torpedo guncotton mining guncotton, ordinary dynamite, and the company's new dynamite (which they manufacture at their works in South Wales) were placed in lead cylinders and fired, the new dynamite showing better results as regards power than either of the other explosives. Experiments were also made with guncotton in which a wrought-iron boiler end was cut in two with 1 lb. of small discs strung across it. Half-a-pound of guncotton placed on the side of an 80 lb. steel double-headed rail cut a hole through the web. A torpedo experiment was shown by placing a miniature Whitehead torpedo charged with 2 lbs. of guncotton under a model ship in a pond, the result

being that both torpedo and boat were demolished, the fragments of the latter being projected upwards into the air with a column of water some 70 ft. high. A tree 4 ft. in girth was then felled by the explosion of 4 lbs. of guncotton discs strung around it as a necklace, and finally an iron weight of 228 lbs. was allowed to fall from a height of 15 ft. on a 5 lb. box of guncotton cartridges, which were not exploded, thus demonstrating the safety of this explosive under concussion.

FOREIGN MINING AND METALLURGY.

Firmness continues the prevailing characteristic of the Belgian coal trade. In the Couchant du Mons ordinary coal has been steadily maintained at 8s. 5d. per ton. Household coal cannot be obtained below 12s. per ton, and the best qualities have even made as much as 14s. 6d. per ton. Coke has also been well maintained. Notwithstanding all the efforts of producers, a quotation of 13s. 8d. per ton has not been accepted by producers, and the old price of 14s. 6d. per ton has been continued. In some cases, however, producers consent to slight reductions, in order to conciliate distant clients; but, even in these cases, the abatement made is not more than 2d. or 2½d. per ton. The imports of coal into Belgium in the first three months of this year amounted to 275,474 tons, as compared with 222,224 tons in the corresponding period of 1882. The imports of coke into Belgium in the first three months of this year were 4827 tons, as compared with 4983 tons in the corresponding period of 1882. In the coal imported into Belgium in the first three months of this year, German coal figured for 120,510 tons, English for 60,062 tons, French for 29,488 tons, and coal from the Low Countries for 65,311 tons. The exports of coal from Belgium in the first three months of this year were 969,546 tons, as compared with 912,020 in the corresponding period of 1882. The exports of coke in the first three months of this year were 286,620 tons, as compared with 272,721 tons in the corresponding period of 1882. Of the coal exported from Belgium in the first three months of this year 908,401 tons went to France, as compared with 860,785 tons in the corresponding period of 1882. Of the coke exported from Belgium in the first three months of this year, 253,299 tons went to France, as compared with 227,836 tons in the corresponding period of 1882. It will be seen that the exports experienced a considerable increase in the first three months of this year.

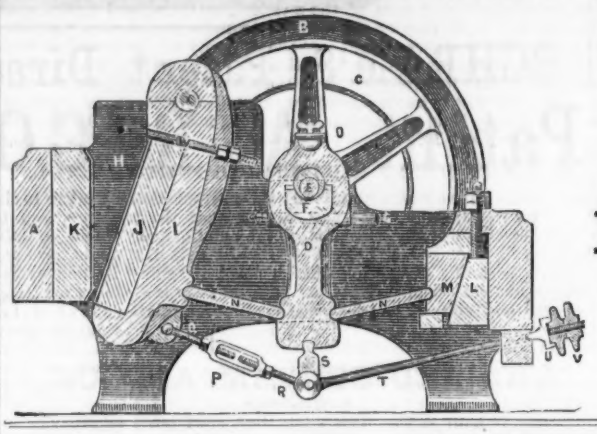
The Belgian iron trade has been a prey to apathy and severe depression, and if this state of things should be continued a considerable amount of injury must be done to the interest concerned. The rolling mills are certainly victims of the situation, not being able to sell their products except at very depreciated rates, while they are compelled to buy raw materials upon rigorous conditions. To put the matter in plainer terms the forgemasters have to pay a minimum of 2*l.* 8s. 10d. per ton for pig, and 7s. 6d. to 9s. 3d. per ton for coal, while they cannot sell their iron above 5*l.* 4s. per ton. An order is about to be given out for 550 trucks for the Belgian State Railways. The letting of this contract will be a favourable opportunity for arriving at a conclusion as to the condition of the Belgian construction workshops, but it is to be feared that they are not too well off for orders. The imports of iron minerals into Belgium in the first quarter of this year were 357,381 tons, as compared with 285,860 in the corresponding period of 1882. The exports of iron minerals from Belgium in the first three months of this year were 117,365 tons, as compared with 88,509 tons in the corresponding period of 1882. The exports of steel rails from Belgium in the first quarter of this year amounted to 14,628 tons, while the exports of iron rails in the same period were 2138 tons. The exports of plates from Belgium in the first three months of this year were 9755 tons, as compared with 8355 tons in the corresponding period of 1882. The exports of rolled iron from Belgium to March 31 this year were 3133 tons, as compared with 40,881 tons in the corresponding period of 1882.

The depression in the iron trade has continued at Paris, and has even somewhat increased. A proposal made by forgemasters in the Nord to establish a large warehouse at Paris has occasioned a fall in prices. In the Longwy group stocks do not go off very freely, and it is accordingly proposed to put out two more blast-furnaces. White refining pig has made 2*l.* 13s. 8d., white speckled pig 2*l.* 14s. 6d., grey speckled pig 2*l.* 15s. 4d., and grey pig 2*l.* 16s. per ton. The Southern of France Railway Company has just ordered 90 locomotives from the Fives-Lille Works. The tenders for these engines will be supplied by an Alsacian company. The St. Nazaire Steelworks Company has just commenced the production of Bessemer. The Eastern of France Railway Company has ordered 51 passenger carriages with two floors, and 102 pairs of carriage wheels, from the Malines Workshops Company. The Eastern of France Railway Company has also given an order for 100 locomotive axles to the John Cockerill Company, at 15*l.* 12s. per ton. The tendency of the German iron market has remained rather favourable, but pig has been in no great demand, and a syndicate of blast-furnace proprietors has decided to reduce quotations for puddling pig. Rolled iron has been scarce upon the German markets; it is, however, difficult to advance quotations in consequence of the excess of production. Iron for building purposes has been in good demand. The German steelworks have still employment assured to them for some time to come, and the rolling-mills will be occupied for the next three months at least by orders now in course of execution. The condition of the German coal trade remains generally favourable.

GEOLOGISTS' ASSOCIATION.—The locality chosen for this year's Whitsuntide excursion is Hunstanton, and as the president and vice-president of the Norwich Geological Society—Messrs. Whitaker and Gunn—have undertaken the duty of directors, a pleasant trip is anticipated. On Monday the party will visit the Hunstanton gravel pit, near the gasworks, south of the station (shingle and sand with marine shells); then proceed northwards to a chalk pit, showing the junction of the white and red chalk, and to the purplish boulder clay that covers the carstone at the southern end of the cliff. Continue along the top of the cliff, and at its northern end attention will be drawn to the peculiar low coast to the west, with its sand-hills, marshes, and submerged forest (a continuation of the Fenland peat). A collection of fossils from the red chalk, made by the keeper of the lighthouse, will be seen and specimens may be purchased. If time allows the walk will be extended to the waterworks, returning along the shore and examine the cliff section which shows white chalk without flints, red chalk, and the hardened ferruginous grit of the lower greensand, certain beds of the last cropping out as rocks along the foreshore. On Tuesday the party will go southwards from Hunstanton to Heacham, where a large chalk pit will be visited, and also the brick yard in the clayey beds of the lower greensand, where casts of fossils in ironstone occur. The gravel pit to the south-east, on the flank of the low chalk escarpment, will then be seen, and the journey continued to the great Carstone pits, north of Snettisham, where the stone is quarried in large blocks for building purposes, and in one of which the junction with the red chalk is shown. In passing members will be able to see the fine church at Snettisham, and at the southern end of that village another brick yard in the middle fossiliferous division of the lower greensand will be visited, and the effect of this mass of clay on the surface of the district will be pointed out. If time allows the party will cross the fine sandy heaths of Dersingham and Wolferton, with small pits in thin flaggy carstone (different from that of the upper division), and will see the section of the lower sandy division of the lower greensand at the latter place, with iron pyrites decomposing to form iron sandstone.

SEGMENTAL PUMP BUCKET.—The pump bucket invented by Mr. THOMAS WILLOUGHBY, of Leeds, is a shallow one, and is adapted to either lift or force pumps. It is composed of expansion rings or segments, with valve or valves, or lid or lids fitted in or on the bottom of the bucket. The expansion rings or segments are worked by the natural action of the liquid in use, and without the aid of any spring, lever, or other mechanical contrivance whatever. The action of the bucket is this:—The bucket is not made to fit tight in the working barrel, and during its descent the water passes through apertures in the bottom. In the ascent the weight of the liquid causes the rings or segments to set themselves out to the sides of the working barrel. Applied as a force pump the bucket will be simply reversed, the action being the same.

ROBERT BROADBENT & SON, STALYBRIDGE,



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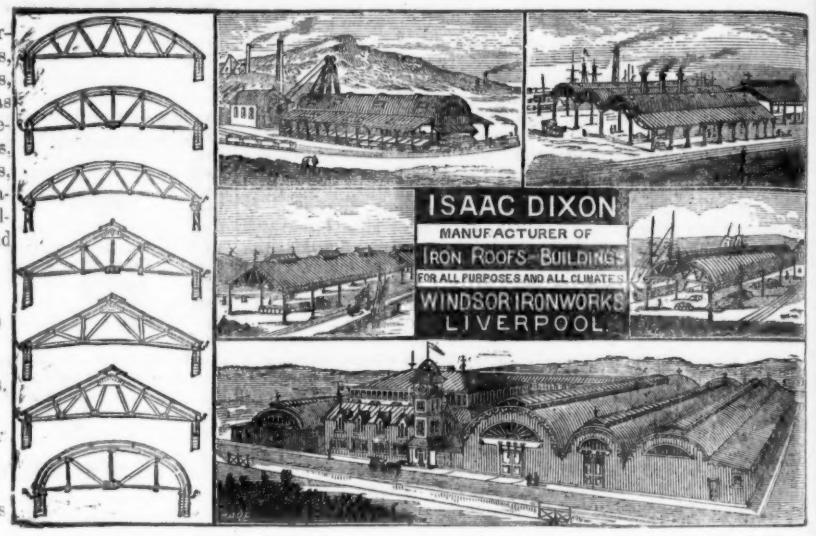

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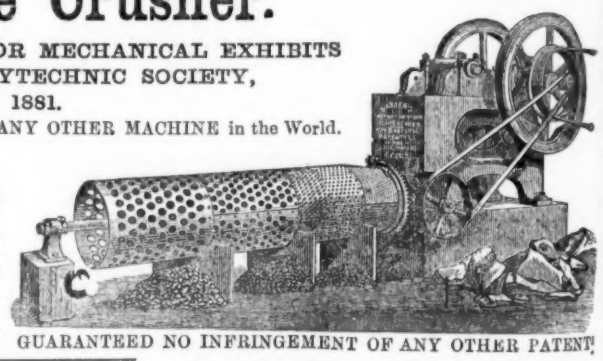

To Mr. Baxter, Leeds. *Cinderford, Feb.* 13, 1883.

DEAR SIR,—I am pleased to be able to tell you that the Machine works splendidly. We are breaking 16 trucks a day now, and we thought it a good day's work to do 10 a day with the old Machine, so you can see the difference. I had a gentleman looking at it yesterday, and he was surprised to see it work so easily. Yours truly, E. ORGAN.

The above refers to one of our 16 by 9 Machines we supplied to replace an "Improved Blake" 15 by 9 Machine.

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PERFORATED IRON, STEEL, COPPER, AND ZINC PLATES IN VARIOUS DIMENSIONS AND THICKNESSES.
Orders Execute with the Greatest Dispatch.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE GERMAN LINOLEUM MANUFACTURING COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.* To purchase, take over, and carry on an established business. The subscribers (who take one share each) are—J. German, Sevenoaks; W. C. Collins, Tulse Hill; E. Nicholson, Wokingham; F. Walton, Twickenham; W. Pringland, Chiswick; W. J. Taylor, Putney; T. Lambert, Richmond.

THE MINAS CENTRAL RAILWAY OF BRAZIL (Limited).—Capital 732,500*l.*, in shares of 20*l.* To construct, equip, maintain, and work a railway in that empire. The subscribers (who take one share each) are—W. Jackson, Walthamstow; B. F. Killerby, East Dulwich; T. H. Linklater, Uxbridge-road; C. H. Linklater, 6, Warnford-court; C. Glanville, 13, Grove-place; A. J. Rugg, Lewisham; R. Mackenzie, Camden Town.

THE CEYLON TEA COMPANY (Limited).—Capital 100,000*l.*, in shares of 1*l.* To purchase or otherwise acquire the business of Anson and Co. and to carry on the general business of tea planters and merchants. The subscribers (who take one share each) are—J. H. Alexander, 66, Inverness-terrace; W. Rollo, 5, Stanley Gardens; W. M. Leake, 65, Fenchurch-street; F. Edenborough, Wool Exchange; J. G. McCullagh, 4, Essex-court; A. M. Gepp, Customs' Chambers; T. Duncan, jun., 50, Mark-lane.

THE CANOVANAS SUGAR FACTORY (Limited).—Capital 200,000*l.*, in shares of 20*l.* The acquisition of a property situated in the Island of Porto Rico, and to continue the business of sugar manufacturers. The subscribers are—N. Lubbeck, 16, Leadenhall-street, 2; P. N. Bernard, 16, Leadenhall-street, 1: T. Lubbock, 16, Leadenhall-street, 1; B. Brown, 16, Leadenhall-street, 1; F. Preston, 16, Leadenhall-street, 1; G. Foot, 16, Leadenhall-street, 1; H. Willstone, 16, Leadenhall-street, 1.

BEYER, PEACOCK, AND COMPANY (Limited).—Capital 350,000*l.*, in shares of 20*l.* The conversion of an established firm of engineers, engine and boiler manufacturers, into a joint-stock company. The subscribers (who take one share each) are—R. Peacock, Gorton; H. Robertson, Corwen; R. Peacock, Gorton; J. Ramsbottom, Alderley; G. H. Wilson, Corwen; H. L. Lange, Manchester; E. J. Webb, 13, Birch-lane.

CASSELL AND COMPANY (Limited).—Capital 500,000*l.*, in shares of 10*l.* To acquire and carry on an old-established business of printers, publishers, bookbinders, paper-makers, stationers, and engravers in all branches. The subscribers are—G. W. Petter, La Belle Sauvage-yard, 10,000; T. D. Galpin, La Belle Sauvage-yard, 10,000; R. Turner, La Belle Sauvage-yard, 100; A. Petter, La Belle Sauvage-yard, 100; J. C. Pare, La Belle Sauvage-yard, 100; S. C. Galpin, La Belle Sauvage-yard, 100; W. J. Woods, La Belle Sauvage-yard, 100.

THE VENEZUELAN COPPER COMPANY (Limited). — Capital 500,000*l.*, in shares of 1*l.* To purchase or otherwise acquire a concession for working mines situated in said country, and generally to purchase, lease, or otherwise acquire, develope, and work mines, minerals, and mining rights in Venezuela. To render marketable, sell, and dispose of the minerals so acquired, and to grant or sell licenses for the working of the whole or any parts of the properties belonging to the company. The subscribers (who take one share each) are—J. L. Keating, Sydenham, secretary; A. L. Hoge, Woolwich, accountant; C. C. Holmes, secretary; E. R. Phillpotts, 71, Elizabeth-street, gentleman; J. H. Roscoe, 5A, Cornwall Residences, clerk; T. Chambers, Felbridge, bank cashier; H. Nicol, Camberwell, accountant. The following constitute the first board:—Sir George Balfour, K.C.B., M.P., J. Cockburn, and Colonel A. C. Walker. The number of directors must not exceed 12 or be less than three. Qualification, the holding of 100 shares.

THE GREAT WESTERN OF VENEZUELA RAILWAY COMPANY (Limited).—Capital 400,000*l.*, in shares of 10*l.* To acquire a certain concession, and to construct, equip, maintain, and work a railway in said country. The subscribers (who take one share each) are—J. Ledger Keating, Sydenham; A. S. Hoge, Woolwich; C. C. Holmes; E. R. Phillpotts, 71, Elizabeth-street; J. H. Roscoe, 5, Cornwall Residences; T. Coomber, Felbridge; H. Nicol, Camberwell.

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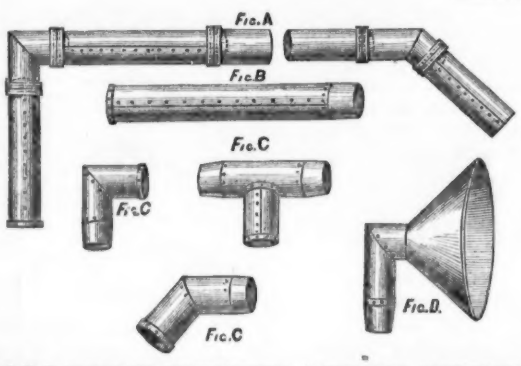

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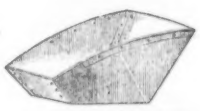
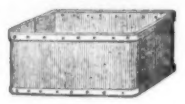

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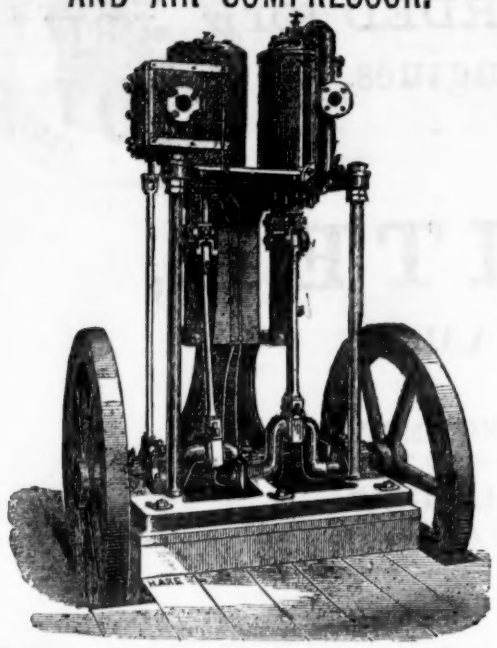

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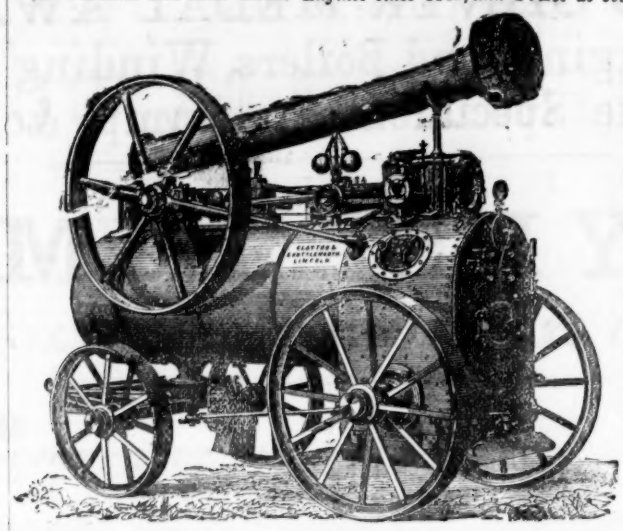

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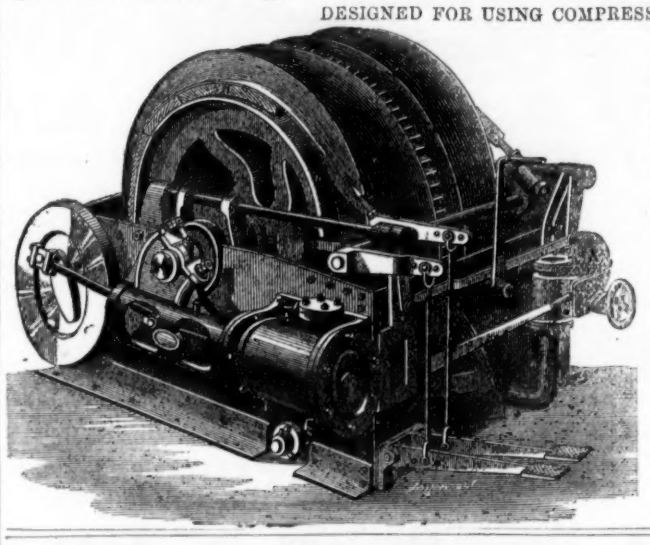

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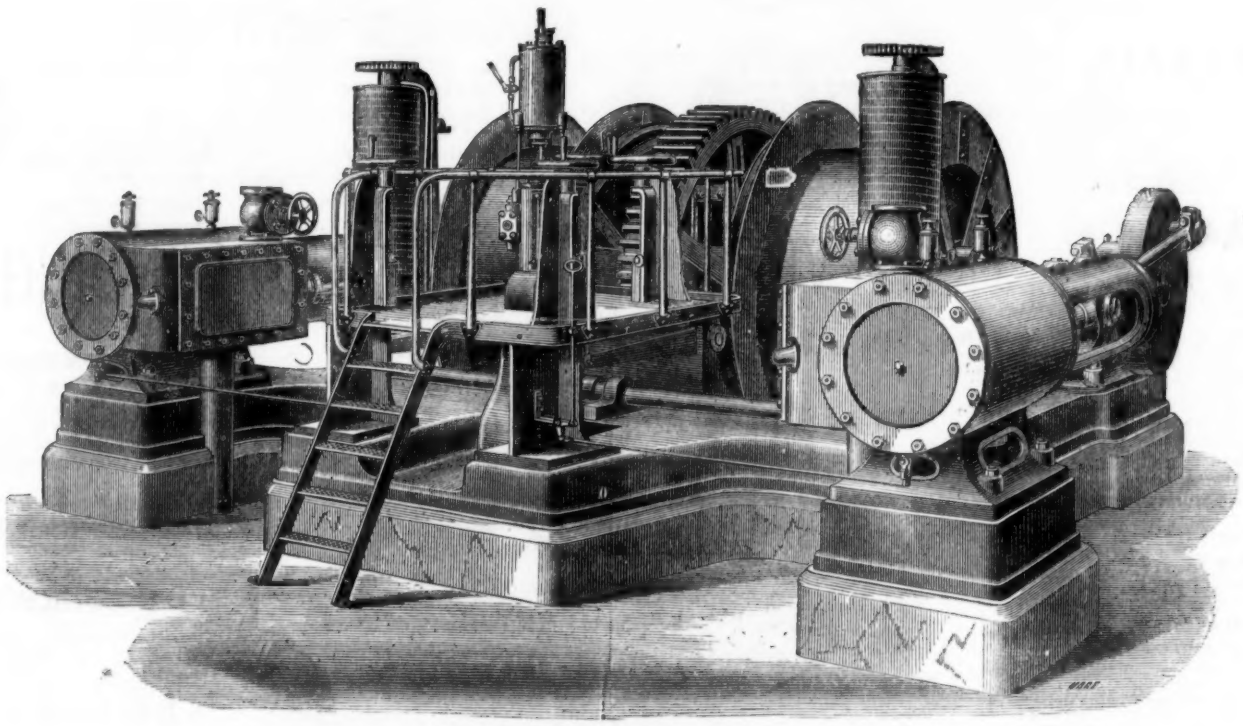

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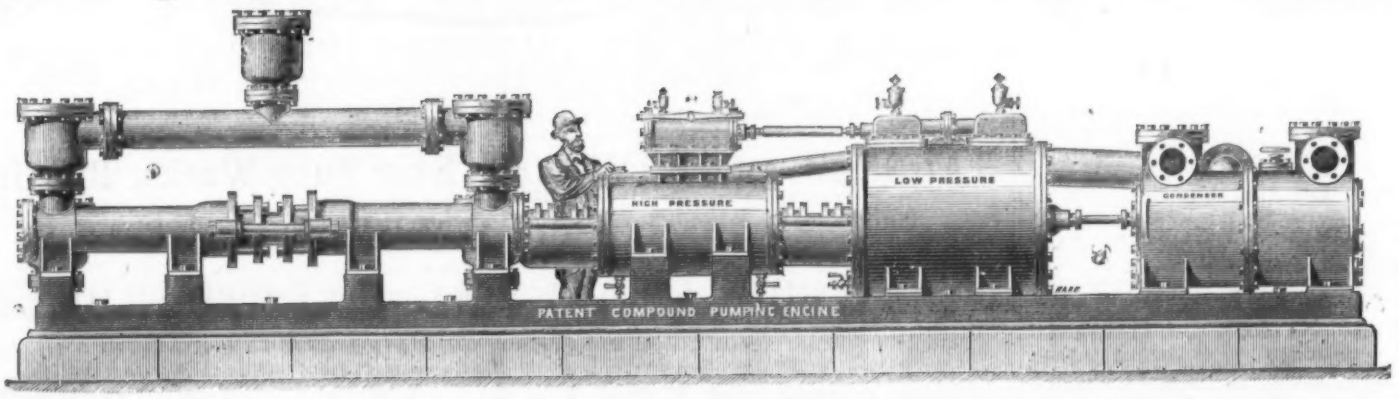

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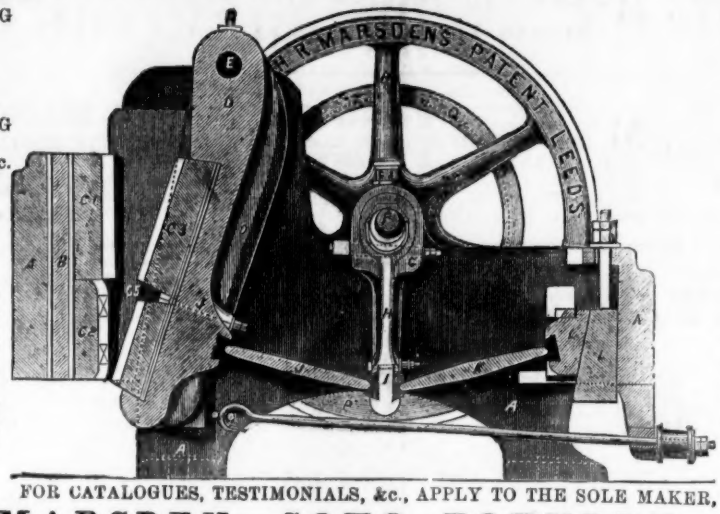

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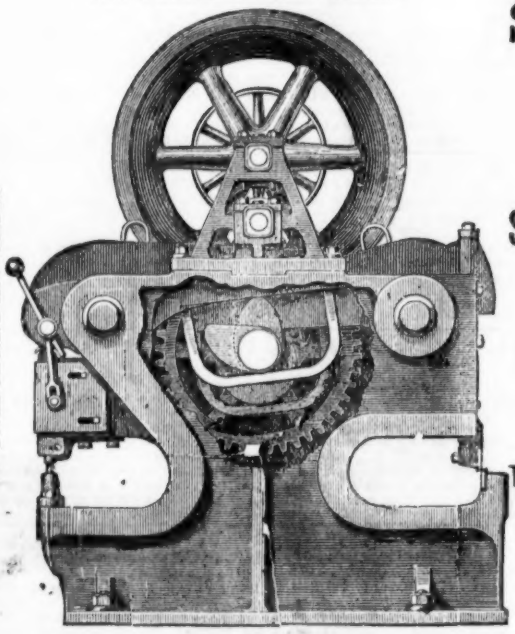

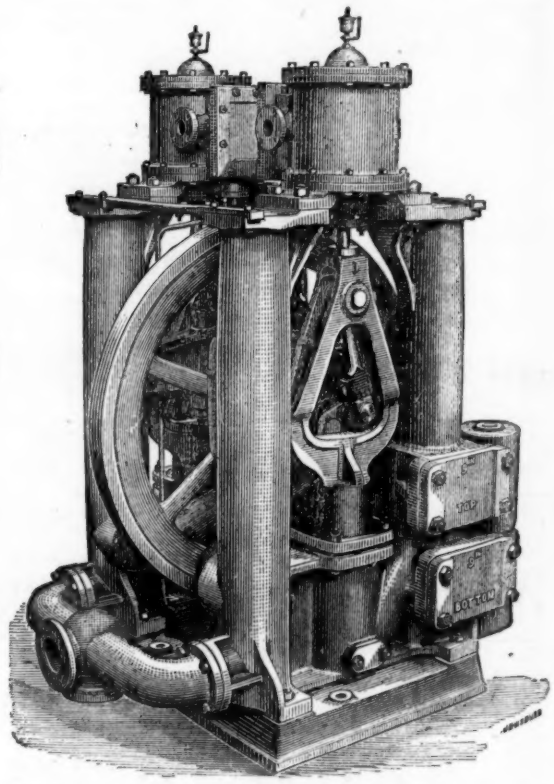

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